

COAL AGE

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No. 4

In many mining communities the entire political, social, moral and educational welfare of the inhabitants is dependent on the whims of the colliery superintendent.

The sanitary condition of the camp, the hospital facilities, the Sunday school, the common school, the condition of the dwelling houses, the character of the saloon or its successor, the blind tiger, the water supply, the goods carried in the commissary—surely in all the world's history no one class of men have had more complete control of a people's affairs than that possessed by the average coal superintendent.

There are children being born into our large mining camps every passing day, who will grow to manhood and then follow on down to old age, without ever changing their place of residence.

If they have no opportunity for education, are reared amid unhealthful surroundings, are offered no encouragement to acquire culture and independence, the blame, in all probability, will be traced back to some superintendent who failed to realize his responsibility.

And yet, in spite of all these facts, you will find plenty of superintendents who never have seemed to realize that their responsibility extends beyond their monthly cost sheet, and if questioned, they would have to admit that they have never given any time to an examination of their tenements except when some miner threatened to move on account of a leaky roof; and as for the moral atmosphere of the camp, they have never so much as given it a thought. Such superintendents generally have families that consider themselves above mingling with the people who live in their town and, as a consequence, even the wives of these superintendents know little about the requirements of the camp's inhabitants.

There is another type of superintendent whose intentions are good in the beginning,

but often, after being opposed once or twice by his men, while attempting to inaugurate reforms, he gives up in disgust and attends strictly to the orders issued by the Big Boss from the general office. It was of such men that Pascal was probably thinking when he said: "Man is neither angel nor brute and the unfortunate thing is that he who would act the angel acts the brute."

Of course, if a superintendent has risen from the ranks, has never seen a modern camp and is unacquainted with modern conditions, very little can be expected from him if left to follow his own ideas, but in the present status of the coal industry, such a man would be hard to find.

No; every one knows what a modern mining camp looks like (there is always one in the neighborhood), but there are plenty of camps still in existence whose destinies are presided over by superintendents who have never taken time to inquire as to what might be accomplished and what ought to be accomplished.

If every mining camp was an incorporated village, how long do you think it would take the politicians to convince the populace that the man in charge of their affairs needed waking up; and how long do you think it would take the superintendent, after once being aroused, to convince the same populace that he and he alone could carry out the dreams advocated by the politicians?

All of which leads us to suggest that whenever you happen across a superintendent who is bored to death and complaining of his narrow sphere of usefulness, take a few minutes off to carefully and earnestly explain to him some of the possibilities that some of his neighbors have uncovered, and, as a final argument, give him this thought from Schiller: "When man is raised from his slumber in the senses, he feels that he is a man, he surveys his surroundings and finds that he is in a state.

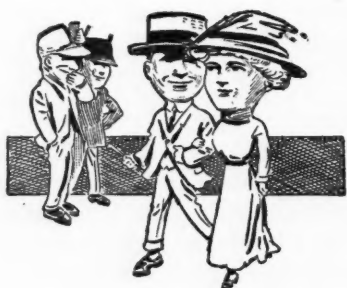
Reformed

BY BERTON BRALEY

Written Expressly for Coal Age



I usta be da greata man
For spenda money free,
I usta rush da growler-can
One beeg sport—datsa me;
But seence I meet one leetla girl,
I was'e no more, no sir,
I no have spent a seengle cent
Onless I spen' on Her!



I usta—when I leave da mine
Go straight to beer-saloon,
But now I go an' dressa fine
An' then you see me soon
Go walking weeth a leetla girl
Weeth softa eyes an' brown,
An' hair that's creenkle up an' 'curl
Da preetiast in town!

Now every time I load a car
I say myself, I say,
"Dere, Tony, datsa go so far
To help for earn your pay,
You worka jus' so hard like dat
An' sava all da time,
Like wise ol' guy an' bye an' bye
Dose wedding bells is chime."



You be da merry bachelore?
Believe me, datsa fake—
You got no theeng for livin' for
W'at use da cash you make?
You listen to da wisa man
An' queet dat dizzy whirl,
You wanta be so smart like me
An' get a leetla girl!

Coal Pulverizing and Mixing Plant

By H. H. KRESS*

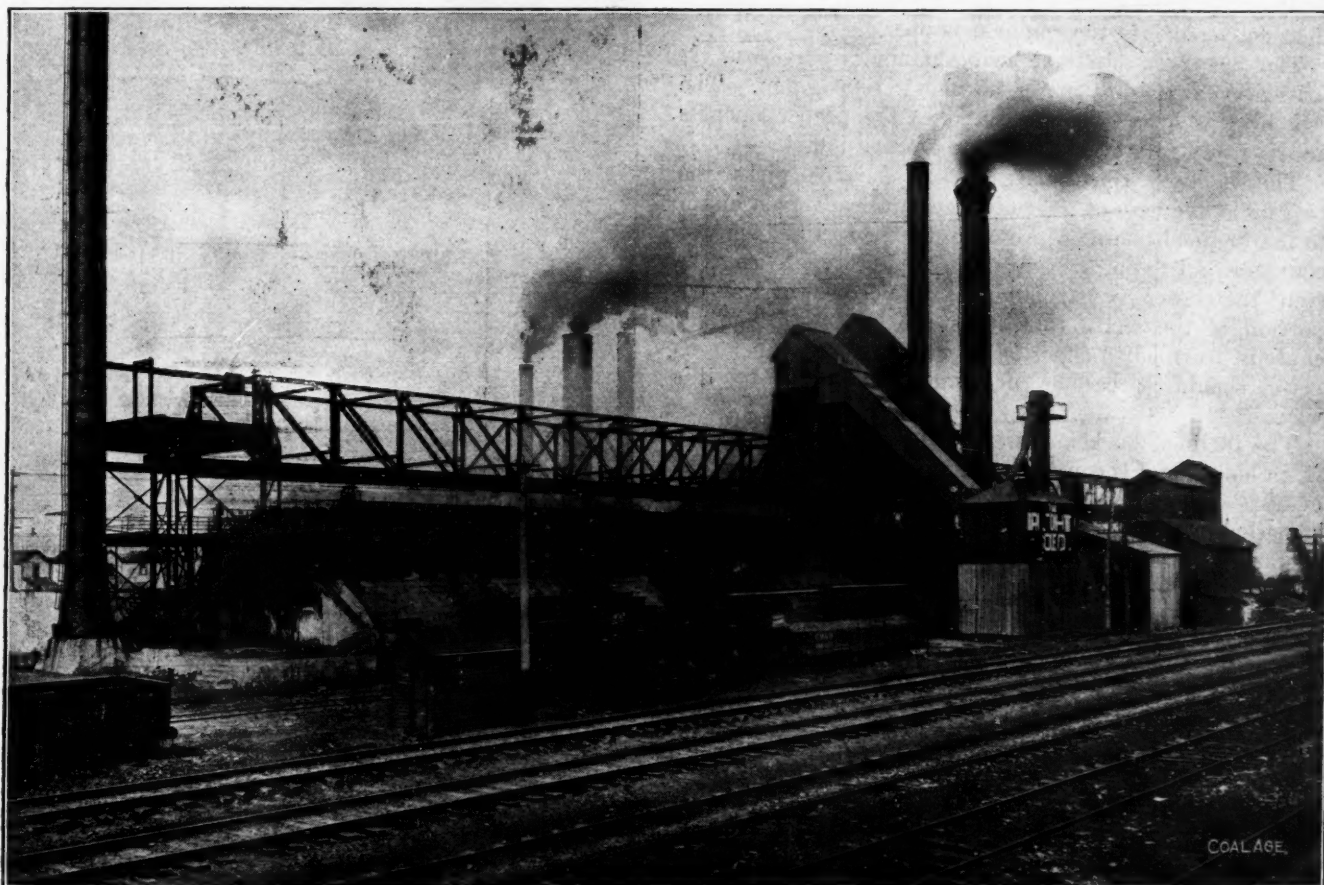
SYNOPSIS—In order to increase both capacity and quality of product, large additions were made to the crushing and mixing apparatus at this coke plant. Both of the results sought were secured.

About a year ago the Hamilton Otto Coke Co., of Hamilton, Ohio, enlarged its works at Cokeotto, located near Hamilton, by installing a modern type of coal-pulverizing and mixing equipment. The output of this company is marketed extensively for domestic and found-

beehive and equal to any byproduct coke on the market."

The enlarging of the plant was accomplished by the installation of additional new equipment, consisting of a complete plant, built parallel to the old one, which can be seen on the right side of the illustration.

The equipment operated prior to the installing of the new was inadequate. The plant was not large enough to produce the output demanded. The old installation consisted of a railroad track hopper, a crusher underneath it and an inclined scraper conveyor, a large central



GENERAL VIEW OF CRUSHING AND CONVEYING PLANT, HAMILTON OTTO COKE CO., HAMILTON, OHIO

dry uses, and the increased demand necessitated an enlargement of facilities. The general view of the plant with the additional equipment is shown in the accompanying photograph.

E. M. Peters, president of the company, stated shortly after the work was completed that "the new machinery and auxiliary equipment consisting of a track hopper, elevating, pulverizing and complete coal-mixing plant was installed primarily to improve the structure of our coke. From the pulverizing alone a decided improvement in the quality of the product was noticeable. After considerable experimenting with different kinds of coal as a mixture, a further improvement was achieved, so that at present the quality of coke we are producing, both chemically and structurally, is superior to most

storage bin, about 100 ft. from the track hopper, received the crushed coal from the conveyor. Modern facilities were lacking on the former equipment and the quality of coke desired was not obtained.

The coal carried to the storage bin by the old inclined conveyor could not be distributed evenly. The new equipment is more modern in every way, having a capacity for handling 100 tons of coal per hour. The equipment consists of a track hopper, a Jeffrey single-roll crusher, a vertical bucket elevator, an inclined bucket elevator, two compartment bins, a mixing plant, a common hopper, a Jeffrey swing-hammer pulverizer, and an inclined bucket conveyor, all of which may be seen in the photograph.

The run-of-mine coal, after being dumped into the new track hopper, is carried by means of a 36-in. beaded flight conveyor to the Jeffrey 30x30-in. single-roll crusher

*Jeffrey Mfg. Co., Columbus, Ohio.

and reduced to 1½-in. cubes and smaller for convenience in elevating, mixing and pulverizing.

The continuous vertical bucket elevator delivers the crushed coal into the two compartment bins, having a capacity of 100 tons each. These are shown in the accompanying photograph. Two different kinds of coal are stored in the bins. The vertical bucket elevator is equipped with a chute, having a lateral, with a valve connection for the distributing of the different grades of coal into the bins. This operation is handled by a single employee, who keeps the bins filled at all times.

The quality of coke depends upon the mixing of the coal proportionally before entering the pulverizer. The mixing is accomplished by two 60-in. dia. horizontal circular-disk feeders, arranged to gage the feeding from 1:10 to 1:3, as desired by the operator. The coal is then delivered into the common hopper.

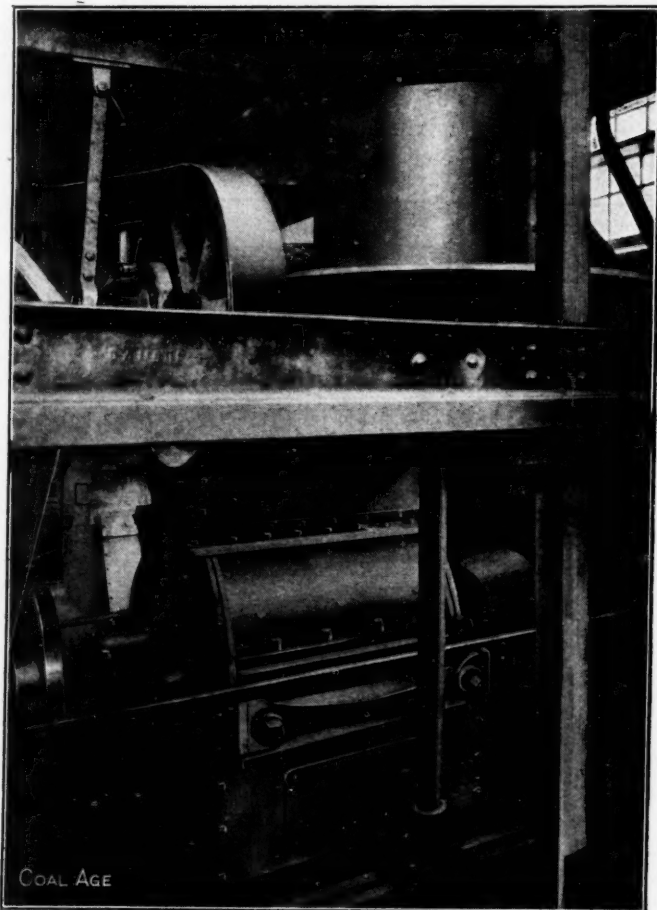
The 36x42-in. Jeffrey swing-hammer pulverizer is driven by a 100-hp. motor at about 1000 r.p.m. The coal by this operation is reduced to the proper fineness and is ready for the large central-storage bin.

The inclined continuous bucket elevator picks the coal up at the base of the pulverizer and conveys it either to the inclined bucket conveyor or to the inclined scraper conveyor. In the accompanying photograph can be seen the lower construction of the conveyor, also a portion of the chute that feeds the buckets. Another chute is provided to deposit coal into the old scraper conveyor should it become necessary to operate in this way.

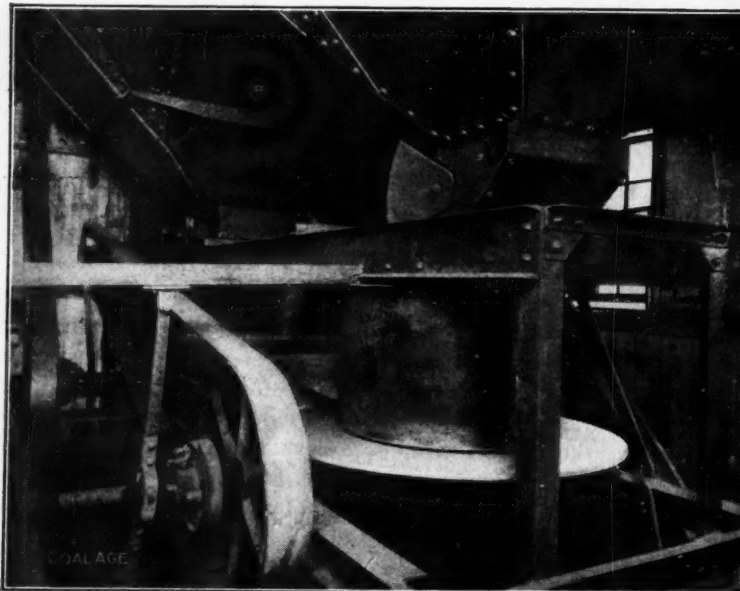
The inclined bucket conveyor operates in a shaft 140 ft. in length and is constructed entirely of steel. A flight of steps is supplied at the side for convenience, and the structure is covered with a wood siding and roofing of a standard prepared composition.

The distribution of the pulverized coal to the central storage bin was improved with the installation of the new equipment. The coal when carried to the bin by the inclined bucket conveyor is taken by a reversible scraper conveyor and dumped uniformly to all parts of the bin. The conveyor is 59 ft. long and traverses the entire length of the storage bin.

The storage bin is directly above the ovens and was built before the new equipment was installed. The latter are of the Otto Hoffman type, composed of two batteries which parallel both tracks, extending on either side of the storage bin, as shown in the photograph. The crushed coal is taken from the central storage by electric larries operating along a steel framework and dumped directly into the ovens.



TYPE B PULVERIZER



GENERAL VIEW OF DISK FEEDERS



SECTION OF BUCKET OUTFIT

The working parts and machinery of the plant are easily accessible. The entire space where the machines operate is covered with diamond-tread iron floor plates, allowing ready access to the working parts without disturbing the rest of the machinery. It requires four electric-driven motors to operate this plant.

The new equipment above described was designed and erected complete by the Jeffrey Mfg. Co., Columbus, Ohio.

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Extracts from a Superintendent's Diary

The word adventurer has always held a great fascination for me, but I'm afraid it lost most of its glamour today. I've been employed superintending the checking in and arrangement of quarters for the carload of strike-breakers who arrived from New York last night.

Surely they are adventurers. Of every nationality and occupation imaginable, and displaying by their talk and manner the abandon and fearlessness used as stock in trade by our popular story writers, they are easily classified. But—

Fiction writers overlook the animals that travel with these people—lice.

Fiction writers don't tell us about the filthy habits and the loathsome diseases that these men discuss continually.

Fiction writers don't even hint at the moral depravity that seems to have taken possession of these human beings.

In fact, I realize now that fiction writers are concerned mostly with what these men do, and they leave to our imagination the consideration of what they really are.

For example, I noted particularly one bright-looking young fellow who, according to his story, had twice circled the globe. He has worked at different times as sailor, "news butcher," hotel porter and circus roustabout. and, without effort, he amused a crowd of our mine guards and company men for hours at a time. Just his "brogue" alone was so amusing that he could have held attention by simply talking, but in addition to his brogue his adventures were most surprising and quite in keeping with the expectations of his audience. But every now and then he would unconsciously let out a little of sure-enough personal history, and then some of our older and more thoughtful men would look serious. It didn't take them long to realize that if this young fellow were accepted into some of their homes and allowed to roam at will he would, ere long, leave behind him a trail of misery quite as difficult to wipe out as a siege of bubonic plague.

It soon became evident that this young fellow was no better and no worse than the others; only he, being somewhat younger than his companions, had less control of his tongue.

Gradually during the day we picked up the life stories of many of them, and, while they varied greatly as to beginnings, they agreed closely as to present tendencies. The same apparent desire to stage all of their adventures in slum surroundings was characteristic of all of them, irrespective of the favorable early training which some of them claimed and, strange to say, I caught myself wondering what effect they would have on the slums,

rather than what effect the slums would have on them.

Of course, we have been outrageously imposed upon by our labor agents in the North. We requested experienced miners, and instead we have been furnished with a carload of men, most of whom never saw a coal mine and have no intention of laboring in one even now. They have their eyes pointed toward a large city just south of us, and they figured, no doubt, that this was a good opportunity to secure free transportation at least part way. But even though they all disappear by morning, their advent in our midst will not soon be forgotten. We've had an opportunity to contrast our men with other men of the world, and we're bound to have a higher opinion of them because of it. It's unfortunate that more of our miners were not brought in intimate contact with these men, but of course, during times of strife, we can't afford to let down the bars just for sociological effect.

And it's quite possible that some of our young women will be able to realize that perhaps our young men, as a whole, are worth catching after all.

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An Increase in Coke Production in Indiana and Illinois

The production of coke in Indiana in 1913 was, according to E. W. Parker, of the U. S. Geological Survey, 2,727,025 short tons, valued at \$13,182,136, this being an increase over 1912 of 110,686 tons in quantity and \$643,451 in value.

All the coke made in Indiana is the product of retort ovens, most of the coal coming from West Virginia. With the completion of the byproduct plant of the United States Steel Corporation, at Gary, in 1912, Indiana rose from a relatively low rank among the coke-making states to third place, outranking West Virginia, from whose mines the Indiana ovens receive the greater portion of their fuel.

The plant at Gary consists of 560 Koppers ovens which, in 1913, produced 90 per cent. of the entire output of the state. The total number of ovens in Indiana at the close of 1913 was 749, while 41 were under construction. Ten beehive ovens at Black Creek were abandoned. The 749 ovens had an average production of 3670 tons of coke, the yield from the coal used being 77.1 per cent.

All the coke produced in Illinois, as well as that in Indiana, is the product of retort ovens, which are fired mostly with West Virginia coal. The common practice is to mix the West Virginia coal with Illinois coal in the proportion of 4 to 1. This mixture is powdered before charging and has been found to make an entirely satisfactory coke with a yield of approximately 75 per cent. There are four establishments with a total of 568 ovens, all of which were in operation during the year; 58 ovens were in process of construction—40 at South Chicago and 18 at Joliet, both installations being additions to plants already established.

The production of coke in Illinois increased from 1,764,944 short tons, valued at \$8,069,903 in 1912, to 1,859,553 tons, valued at \$8,593,581 in 1913, or a gain of 94,609 tons and \$523,678 in value.

It is remarkable that in neither of these states, Indiana or Illinois, are there any of the old-fashioned beehive coke ovens in operation.

Organization and Preparation for Mine Rescue Work

BY GEORGE E. SYLVESTER*

SYNOPSIS—Although the Bureau of Mines has done much to put mine rescue work upon a solid basis, the political subdivision of government exercising control over the mining industry should logically organize and maintain a force to cope with emergencies. Training in first aid should approximate actual conditions.

Wherever bituminous coal is mined there seems to be no way to entirely eliminate the possibility of mine explosions.

The extensive investigations which have been made, the numerous remedies recommended, and now in use, have undoubtedly done much to minimize the number of such disasters. It is, however, probably a fact that the modern practice of mining, with its increased use of machinery, more rapid development, with more extensive and deeper mines, does, increase to some extent the danger of explosions.

While it would seem that with the increased use of preventive measures mine explosions should diminish, statistics show that there is but little, if any, gain. While doing everything possible for its prevention, we must admit that the explosion or mine fire remains a possibility, and although it may be a rare occurrence, we should be prepared to handle the emergency when it comes in the best possible manner.

A general mine explosion is usually too great a disaster to be handled by the individual company, which must rely on public aid. And to give aid in such cases is clearly a province of the state. The question to be considered is, therefore, how can such aid be given with the maximum efficiency and economy.

The oxygen breathing apparatus is recognized as one of the most effective instruments in rescue and recovery work after an explosion. The Bureau of Mines has thus far taken the lead in the introduction and practical use of this apparatus. It has tested out and given its approval to such types as were found practical for actual use; has given instructions and issued certificates of competency in the use of the equipment to a considerable number of the miners from practically all of the coal fields, many of whom have rendered valuable aid in emergencies; and the trained men in its service have given active assistance in many of our worst disasters.

While much of this work can only be done to advantage through such a department, its efforts must in the nature of things be largely investigative and educational, and the question of direct organization should be taken up by the power in direct authority.

THE STATE SHOULD ORGANIZE A RESCUE FORCE

The state is the political division assuming the direct supervision over the mines within its boundaries. But with one or two exceptions the various states have thus far been content with the matter of regulation only, leaving the caring for emergencies to the volunteer services

of the individual or to the Bureau of Mines. I think I am safe in making the assertion that the greatest need in rescue and recovery work after an explosion is organization.

Organization in such a case necessitates one direct head, who must assume entire responsibility, and definite units of men under their respective leaders who understand their particular work, and who will recognize and obey the proper authority.

The chief, or in his absence, the district mine inspector, is generally expected to assume supreme responsibility, and is logically the person best fitted to direct such organization, since the general mining law of the state gives him certain authority which the individual or the federal official cannot have.

At such times the organization of the mine itself is highly demoralized. Sometimes those in direct authority are among the victims or are not in condition to assume command. The mine officials, however, should, and usually do, act in conjunction with the inspector at such times.

If an inspector is to be expected to assume such responsibilities he should be given the necessary authority and the means to carry out this work to the best advantage. This means that there should be at his disposal, a trained organization and a fund upon which he may draw for any necessary expense.

There are two ways whereby a state organization for such emergencies, may be perfected. A permanent organization of picked men may be established under regular salary, who shall hold themselves in readiness for emergencies; or a volunteer corps, might be organized, distributed throughout the field; who while carrying on their ordinary work as miners, shall maintain themselves in condition, and hold themselves in readiness to respond to a call for their services.

If mine explosions were of frequent occurrence, which fortunately they are not, the former might be the more desirable method, although a force large enough to be effective would doubtless be expensive. With disasters as infrequent as they are at present, and with reason to hope that their frequency will decrease, the latter system seems to be preferable.

There is nothing new in such a system of organization. In the smaller towns and cities where fires are not of frequent occurrence, the volunteer fire department, when kept efficient by frequent drills, has proved to be the most effective way to economically handle this form of disaster.

A RESCUE ORGANIZATION IS COMPARABLE TO THE MILITIA

The state has need of a military force to cope with emergencies yet maintains no standing army, relying on a volunteer organization, the militia. Sufficient compensation is given for drill and training, which latter does not interfere with the ordinary occupation of the member.

There seems to be no reason why an organization for mine rescue work, based on the same plan, should not

*Chief Inspector, Mining Department of Tennessee.
Note—Abstracted from a paper read before the West Virginia Mining Institute, Cumberland, Md., June 3, 1914.

prove what is needed. The fact that many miners in the various states, without compensation, and often with a certain amount of expense to themselves, have taken advantage of the instruction offered by the Bureau of Mines, shows that we could count on them to do their part. The operator should also coöperate, for an available, well trained rescue corps, besides its value in case of explosion, might at times prevent disastrous mine fires.

It is true a number of our large operators maintain rescue apparatus with efficient corps of trained men. It cannot be expected, however, that the smaller mines will be thus provided. Even should an operation maintain such a corps, in the event of a serious explosion it would still need assistance from other sources.

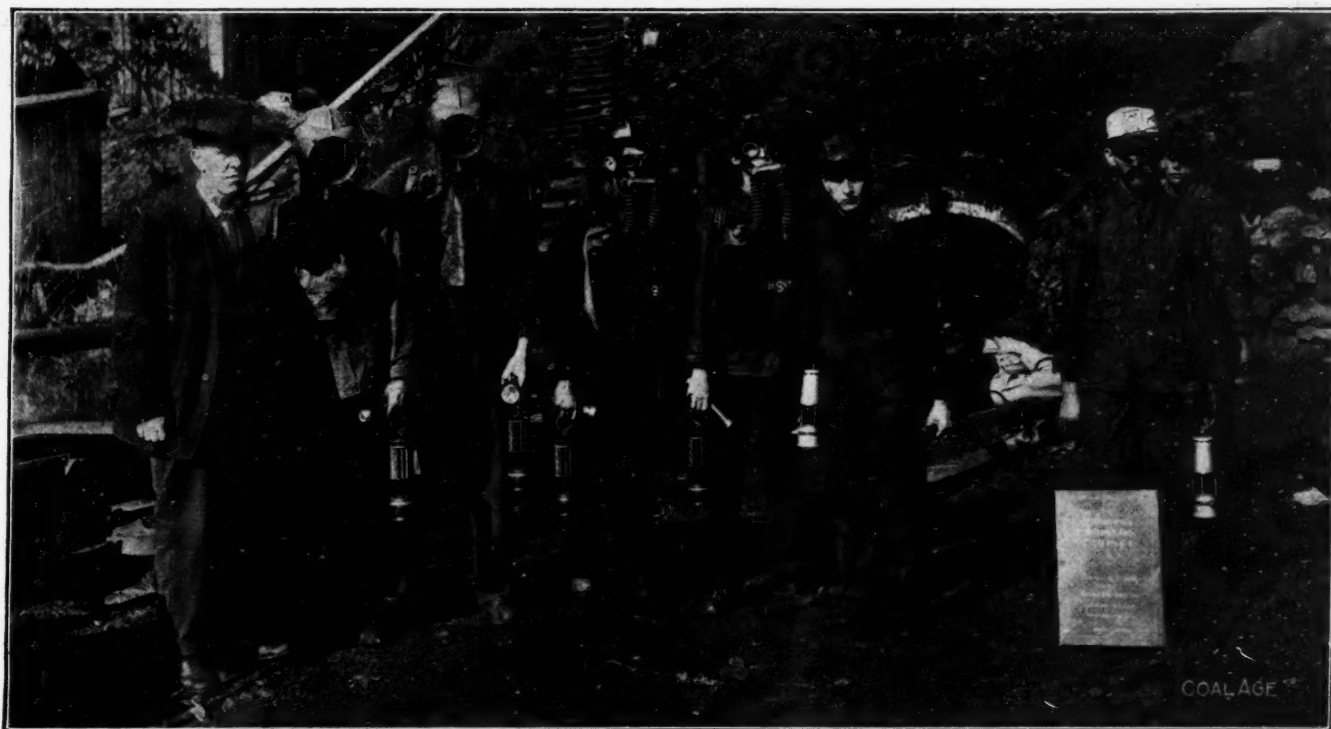
In order to form and maintain such an organization, and to properly distribute the corps, the state should

ber of thoroughly organized corps which could serve as units in rescue work.

TEAM WORK IS IMPORTANT

The question of team work is of great importance. It is recognized that the corps, and not the individual, must be the unit in rescue work, as no man should go alone, or even with one companion. Five members seem to make the most effective working force, since if one is overcome, or meets with accident, there are four left to bring him back.

No matter how many men may volunteer in emergency, organization is lacking; the men are strangers to each other, and naturally doubt the courage or judgment of others. The weakness of the individual then becomes the weakness of the whole corps. Also the particular apparatus worn is new to the volunteer. It is not the



A MINE RESCUE TEAM ORGANIZED UNDER TENNESSEE LEGISLATION

furnish the apparatus and provide the supplies for same; there also should be sufficient compensation to the members to maintain regular drills. New men could be trained at these drills who would be eligible to act as substitutes, thus keeping the corps always up to full strength.

The operator should necessarily coöperate by furnishing the station and place for drill, which need not be elaborate. He should also assume the responsibility for keeping the equipment in condition.

The pay which each member should receive for drill should be sufficient to attract the best men from the mine or mines where the corps was located.

The workings of the corps should be under the direct supervision of the chief inspector, who should lay out the general system of the work and receive reports of same from the several corps captains. He should also be empowered to call on any or all corps for any serious disaster within the state. In this way the inspector could have at hand in an emergency a sufficient num-

ber of thoroughly organized corps which could serve as units in rescue work.

one he has tried and tested out in many drills in the smoke room, and he feels that it may show a defect at the critical time.

With proper organization on the other hand, there could be brought together in emergency, not a sufficient number of individuals, but a number of organized corps, each member having confidence in his apparatus and his associates.

We have considered thus far the subject only with reference to work with the oxygen apparatus. As a matter of fact this may be, and often is, a small part of the question. The restoring of ventilation, building temporary brattices, and opening up a passage where falls have occurred must necessarily be done, and can probably be best accomplished by a volunteer force from our mines. Here, too, the question of organization is all-important, for there must be no haphazard work to add special danger to that which already exists.

While every disaster forms its own problem, the official rescue corps could, besides their drill in the appa-

ratus, be instructed in the general principles involved, and the dangers to be avoided. Men with this training might often do extremely valuable service in emergency.

Such a plan as I have attempted to outline would, if carefully carried out, result in an efficient organization, economical in administration, and well distributed through the mining districts. It should contain picked men from all sections, whose everyday work in the mines would tend to keep them in the best of physical condition.

RESCUE LEGISLATION IN TENNESSEE

Last year the State of Tennessee enacted legislation with the object of bringing about as far as possible such an organization. This bill provided for the maintenance of a limited number of such volunteer corps, where an operator, or combination of operators, would furnish the apparatus, place for drill, and the necessary number of qualified men could be found to constitute a unit.

The bill set forth in detail the minimum amount of apparatus and the requirements of the operator, the qualification of men forming the corps, the requirements of a monthly drill, and the amount paid by the state to the operator for the materials used and to the members for drilling. No restrictions were placed on the private use of apparatus or corps, the only obligation imposed being the standard to which the apparatus should be maintained, and the monthly drill, together with the agreement to respond to a call from the chief inspector in case of a mine disaster, and to report with apparatus at any point in the state.

The obligation called for reporting for duty only, the actual entrance into danger being voluntary. Provisions were also made, giving the inspector authority at such occasions, with power to draw on the general rescue fund for necessary expenses, also for the compensation and expense of regular corps or specially qualified volunteers in case of a disaster. Provisions were likewise made for the employment of men for organizing and training in both rescue and first-aid work.

A station formed under this law directly after its passage, has shown that in detail it will give very satisfactory results. The unusual depression in the coal business in Tennessee since this bill was passed, together with the fact that much of the state's coal is produced in small independent mines, has been responsible for less being done in this work, thus far, than could be desired.

SUGGESTION FOR FIRST-AID WORK

Rescue work and first aid are usually considered to have a more or less intimate connection. Rescue training should include the principles of first aid, although the latter as such does not necessitate any knowledge of rescue work.

In practice in rescue work the corps or team is the unit, while with first aid, although the training and drill are by team, the actual practice is usually by the individual.

While some legislation seems advisable in order to perfect organization in rescue work, little necessity exists for same in first aid, although each mine should be required by law to keep on hand suitable first-aid supplies.

The object of first aid is to teach the miner to be able to care for an injured man in the best manner possible until the arrival of medical assistance. While a miner

will always do what he can for an injured comrade, it takes a greater incentive than the mere desire to be qualified for such an occasion, to induce him to learn this work.

While present methods have been successful in creating an interest in first aid, it does not seem to have entirely reached the desired end. To be the winning team on a field day seems to be a most powerful incentive, and tends to develop a group of a limited few, trained to a high degree of efficiency. While at a field day there are one- and two-man events, these are participated in only by picked men, and the members of a well organized corps are trained to work together.

When an accident actually occurs in the mines it is only by chance that a single member of the team is present, while the possibility is extremely remote that the whole team would be on hand to work as a unit. What usually happens is that those present do the best they can until the arrival of a first-aid man, who with such help as he can get cares for the injured miner. Often, as in the case of arterial bleeding, or electric shock, quick attention is required and there is no time to hunt up a first-aid man.

CONTESTS SHOULD APPROXIMATE ACTUAL CIRCUMSTANCES

While it is hardly possible to have every man efficient in first aid, a more general acquaintance with the fundamental principles of this work would be highly desirable.

To hold the interest in this work the highly organized and efficiently trained team appears to be necessary, but it seems that our field days could be so arranged as to increase the general interest among the rank and file of our miners, and to represent more nearly the actual conditions under which accidents occur.

In local contests, where a considerable number of men from each mine could be present, in addition to the usual events, a simple one- or two-man event could be arranged, to be participated in by men chosen from among the general body of miners of each mine, outside of the first-aid teams; or, as in a real accident, one first-aid man could choose his necessary assistants from the miners at hand. A team event might be arranged for a single member of a corps, the remainder of the team to be picked at the time by a disinterested party, or in any other manner, from the miners present who are not members of a regular team.

While I do not know of any field days where such innovations have been tried, it may be possible that something along this line, while in no way detracting from the general interest in such occasions, might tend to stimulate a more thorough diffusion of the knowledge of first-aid principles.

Historical Mine Fires—A coal bed in Colorado has been burning for nearly a hundred years. In some of the Welsh coal mines there are fires that have been alive quite as long. Near Summit Hill, Penn., a fire has been burning in a body of anthracite for fifty-three years. It is still unquenched. Already it has destroyed coal to the value of \$26,000,000. Almost as many millions have vanished in the same way in a fire in an Ohio coal bed that has lasted twenty-eight years. Near New Castle, Colo., the first white settlers observed smoke rising from a mountain plateau. At first they thought it came from an Indian encampment. But it continued week after week. Investigation proved that a seam of coal was burning. From the Indian traditions it appeared that this fire had been burning more than a century. At Carbondale, Penn., subterranean fires that have been burning for ten years have caused the earth's surface to subside.—"The Analyst."

Plant of the Borderland Coal Co.

SYNOPSIS—At this plant coal is mined in Kentucky and loaded on cars for market in West Virginia. At one operation a double bucket cableway is employed, while at a second plant, an apron conveyor transports the output of the mine across a river.

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Mining coal in one state and loading it for shipment in another has its advantages and its disadvantages. The disadvantages are less when the state boundary is an imaginary line than when it is a physical barrier, like the river which the Borderland Coal Co. has to cross in getting its product from the mines to the railroad cars.

Tug Fork of Big Sandy River forms the boundary between Mingo County, West Virginia and Pike County, Kentucky, and the Norfolk & Western Ry. here runs along the West Virginia side. The Borderland coal

P. Wood is vice-president and Ernest B. Fishburn is secretary-treasurer.

Operation is in charge of L. E. Armentrout, manager, who resides at Borderland and has been the "man behind the gun"—as distinguished from the "men behind the check book" at Roanoke—in the big job of developing the plants to their present efficiency. His burden of the past has been lightened by the recent advent of C. A. Jones as general superintendent, under whom are the two mine superintendents, J. O. Sinnott, at No. 1, and H. Martin at No. 2. For the upper and middle seam workings at No. 2 Supt. Martin has J. R. Roach and Joseph Edwards, respectively, as mine foremen. The lower seam workings are new, and neither the middle nor lower seams are yet being mined extensively at No. 1 operation.

The Borderland Coal Co. was formed in 1903 to open No. 1 mine in the Winifrede seam. The original plant



GENERAL VIEW OF NO. 1 PLANT OF BORDERLAND COAL CO.

property is on the Kentucky side and the product must be taken across the river for shipment.

The property includes 3300 acres, extending about two miles along the river and yielding coal from three workable seams. High in the hills, about 500 ft. above the river, is the Winifrede seam, available over about 25 per cent. of the acreage and averaging 6 ft. in thickness. About 130 ft. beneath this is the Miller's Creek seam, varying in thickness from 3½ to 4 ft. About 250 ft. lower still is the Thacker seam, 4 to 4½ ft. thick and available over about 75 per cent. of the property.

To get out this coal the company has installed two plants, No. 1 at Borderland station, 5 miles northward from Williamson, and No. 2 the newer operation a half mile farther north.

The main offices of the company are in Roanoke, Va. Edward L. Stone is president of the corporation, James

was a modest affair, with a continuous bucket carrier across the river from the head house on the Kentucky side to a simple loading outfit at the railroad.

The high quality of the product gained it an unexpectedly good market and the demands for greater tonnage could not be satisfied by the original carrier, so in 1908 the present two-bucket cableway was installed. Continued growth of the outlet possibilities led to the installation of the No. 2 plant in 1910, equipped to work all three seams, and delivering the coal across the river by a long apron conveyor.

A FINE DOMESTIC COAL IS PRODUCED

Borderland Block is the coal by which the company is best known, as under this trade name the 5-in. lump goes to a high-grade domestic market through the central and northwestern states.

At No. 1 the railroad takes nearly all the coal smaller than 5-in. lump, using about 10,000 tons per month, so that little other than Borderland Block is shipped from this plant.

All coal passing through the 5-in. screens at No. 2, and all over railroad requirements at No. 1, are washed and separated into egg, nut and slack. The egg is shipped as a domestic and steam fuel, while the nut and slack go as steam coal for the stoker-fired boiler plants of several electric railways and paper mills. These are ideal consumers, requiring a fairly constant tonnage at all times.

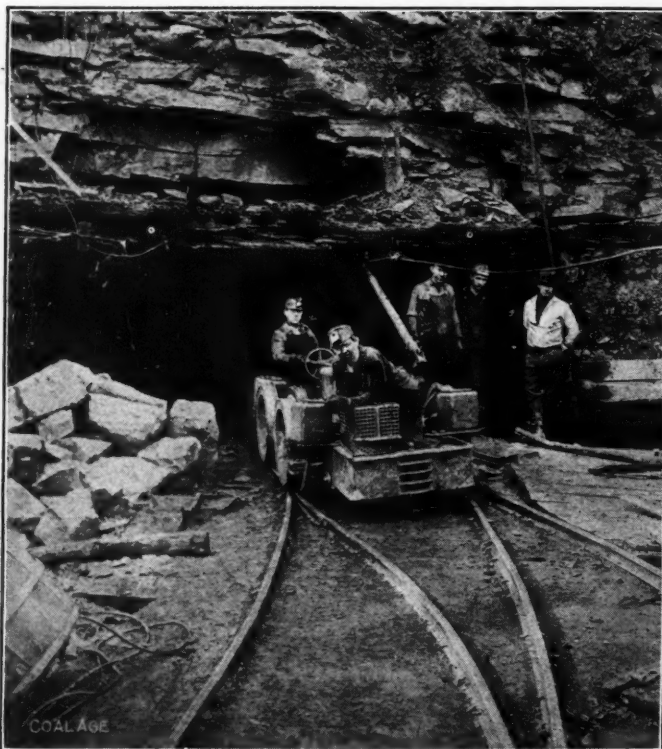
The product is sold through the Borderland Coal Sales Co., Union Trust Building, Cincinnati, this separate corporation having been organized in 1911 for more effective marketing of the output than had been possible

conveyor to the bins over the railroad tracks. The latter has a capacity of 750 tons, with chutes for coaling locomotives on four tracks. All Norfolk & Western freight and coal trains stop here for fuel, as do also some of the through passenger trains. The railroad operates the coaling plant with its own men and pays the Borderland company a tonnage rate for all coal weighed onto the conveyor.

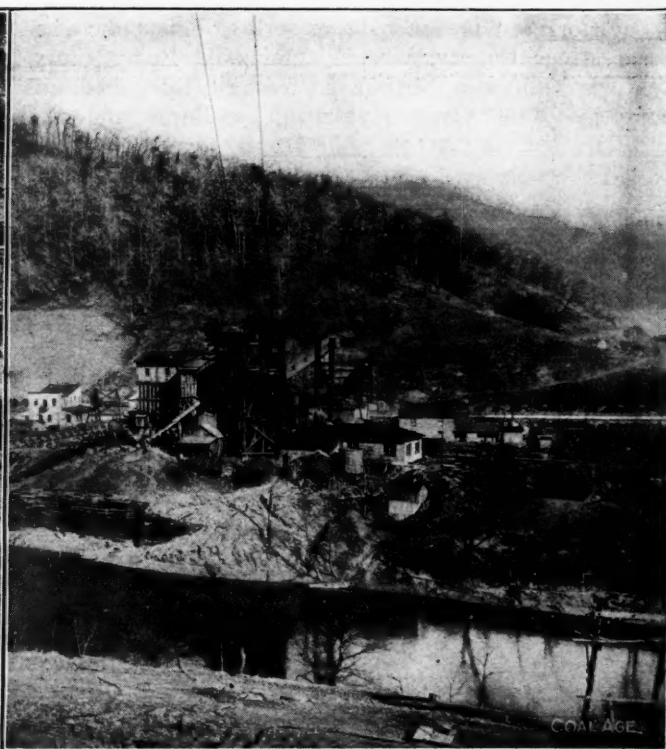
The complete locomotive fueling plant, as also the washer and screen equipment, was furnished by the Jeffrey Manufacturing Co.

ELECTRIC POWER AND MINING

In the early days the plant was practically without power. The original cableway operated by gravity (as does also the present one), the mining was by hand and the haulage by mules and gravity plane. When the ca-



MOUTH OF NO. 1 MINE, WITH GOODMAN 6-TON SINGLE-MOTOR HAULAGE LOCOMOTIVE



LOOKING BACK TOWARD THE NO. 1 PLANT FROM MINE SIDE OF RIVER

through general sales companies. The Edwards & Bradford Lumber Co., Sioux City, Ia., is agent for the Northwest.

It should be here noted that the Borderland Coal Co. is a Virginia corporation, mining coal in Kentucky, loading it in West Virginia, and shipping it to Ohio and beyond.

The cableway, at No. 1, with its two 4-ton buckets, gives a capacity of 1000 tons per day, and the other equipment is arranged accordingly.

The coal as brought across the river is dropped into a receiving hopper, from which it is passed over 5-in. screens. All going over the screens is loaded as Borderland Block; what passes through goes either direct to the locomotive coaling bins or to the washer plant for cleaning and preparation for shipment in any desired grades.

The locomotive fuel passes a continuous weighing apparatus at the receiving end of the long inclined apron

capacity was increased in 1908 the mine was electrified; solid shooting was abolished and the mules banished.

The power-plant equipment includes two Atlas horizontal tubular boilers, furnishing steam for two 100-kw. direct-connected right- and left-hand units. Each unit consists of a Skinner engine and a Goodman generator. Between them is a double switchboard. The entire power-plant equipment being furnished by the Goodman Manufacturing Co.

ONLY ONE SEAM IS NOW WORKED

Only the top, or Winifrede seam, is as yet being worked at No. 1. The coal is undercut by five Jeffrey breast machines.

Gathering, the distribution of empties and making up trips of loads, is done by Goodman 3-ton single-motor locomotives of the "1600" type. There are five of these machines at this mine, four regularly at work and a fifth on spare. Two 6-ton single-motor locomotives of the

same make do the main haulage work between partings inside and the head of the gravity plane outside.

The head house where mine cars are dumped and the cableway buckets loaded is at the level of the middle seam, so that this coal can be handled through it when that seam is opened. The top seam opening is located some distance around the mountain. A short haul from the drift mouth at the level of the top seam

brings the mine cars to the head of a 30-degree gravity plane, 350 ft. long, down which they are lowered to the main roadway at the middle seam level, where an 8-ton Porter steam locomotive hauls them around to the cableway head house, a distance of 3400 ft.

NO. 2 PLANT WORKS ALL THREE COAL BEDS

Started in 1910, the plant at No. 2 has only within the present year been completed for working all three seams. Still further growth is in prospect when the contemplated building of a railroad along the Kentucky shore of the river makes it feasible to install independent plants, at both operations, for separate preparation and shipment of coal from the lower seam, which differs materially in character from the quite similar coals of the top and middle beds. At present the lower-seam workings at No. 2 are just started and their small production is mixed with the larger tonnages from above.

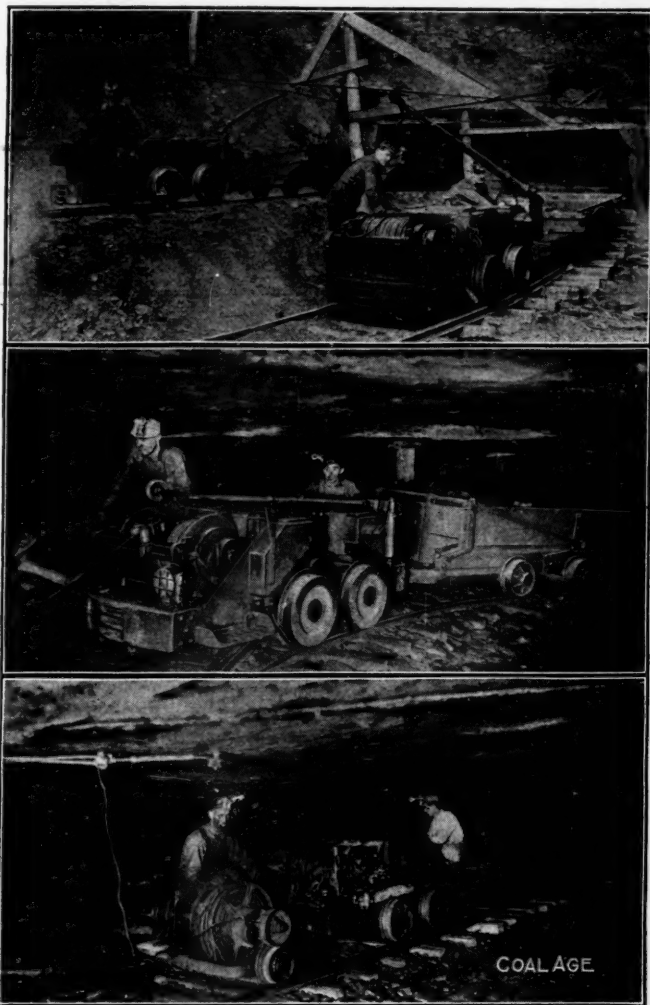
There being no locomotive fueling equipment at No. 2, the preparation plant for small coal is of greater size and importance than at No. 1, and furthermore it is continuously operated. The washer and screening equipment is all steam driven, as is also the long apron conveyor by means of which the coal is brought across the river.

This conveyor is 950 ft. in length and was, when new, the longest of its kind ever installed. Its inclined portion—222 ft. long and on a slope of 19 degrees—has a gravity effect such that only 5 hp. is required for operating the entire apron, with full load, in cold weather. In warm weather, and with good lubrication, on the other hand this conveyor will run without power consumption.

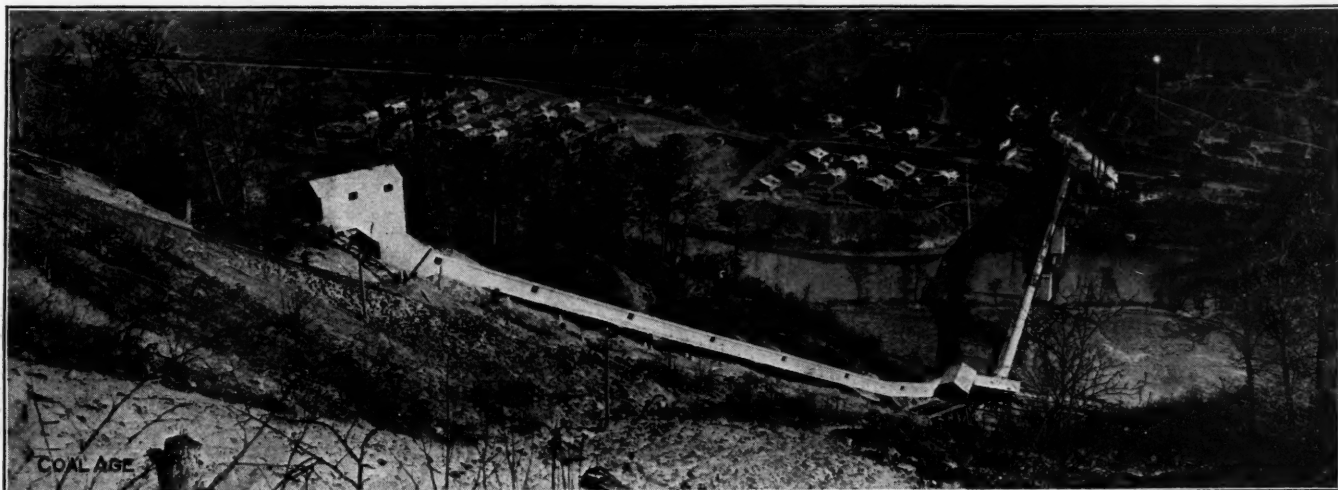
Whereas at No. 1 plant there is a suspension bridge across the river, at No. 2 the conveyor framing includes a travelingway beneath the conveyor proper, which together with the coal-preparation machinery was furnished by the Jeffrey Manufacturing Co.

On the mine side of the river everything is electrically operated, driven from the power house on the railroad side. This power house is a duplicate of that at No. 1, except that there are three boilers, one extra being necessary to drive the steam engines operating the washing and screening machinery.

The two generator units are identical with those at No. 1, having 100-kw. Goodman generators directly



GOODWIN GATHERING LOCOMOTIVES AND SHORT-WALL MINING MACHINE ON ENTRY



SHOWING LENGTHY CONVEYOR SYSTEM AT NO. 2 MINE

coupled right and left to Skinner engines and delivering current for distribution at 250 volts from a switch-board placed near the wall between the two generators.

The output of this plant is practically all used on the mine side of the river, mainly in coal mining and haulage.

The head of the apron conveyor crossing the river is at the level of the lower seam. The hopper from which it is fed receives the coal from all three measures—only temporarily, however, from the lower one. The lower-seam cars dump directly to the hopper. The middle-seam coal is received from a retarding flight conveyor, recently installed by the Webster Manufacturing Co. while the upper-seam coal is brought down in 6-ton monitors on a gravity plane 650 ft. long.

MINING THE UPPER SEAM

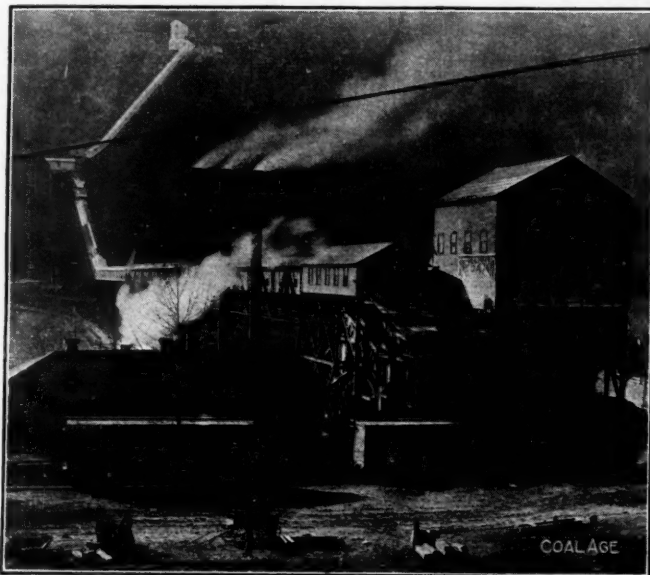
The upper, or Winifrede seam, was here first opened in 1910. The coal runs about 6 ft. high and of the same fine quality as at No. 1. The mining conditions are exceptionally good, with firm sandstone top and clean bottom. The coal is all cut by shortwall mining machines, there being three in use at present, two Goodman and one Sullivan.

Three Goodman 3-ton "1600" locomotives, with mechanically driven electric cable reels, do the gathering; while for haulage there are two Goodman 6-ton, "2600" locomotives, one doing all the work of present production, with the other on spare. Cars of 2 tons capacity are used, on 48-in. track gage.

Both the other mines are in the early development stage. The lower seam was entered in 1912 but has not been carried beyond a few cars of production daily. Middle-seam work was begun in 1913 and has been

pushed for rapid development, so it is already far in advance of the lower mine.

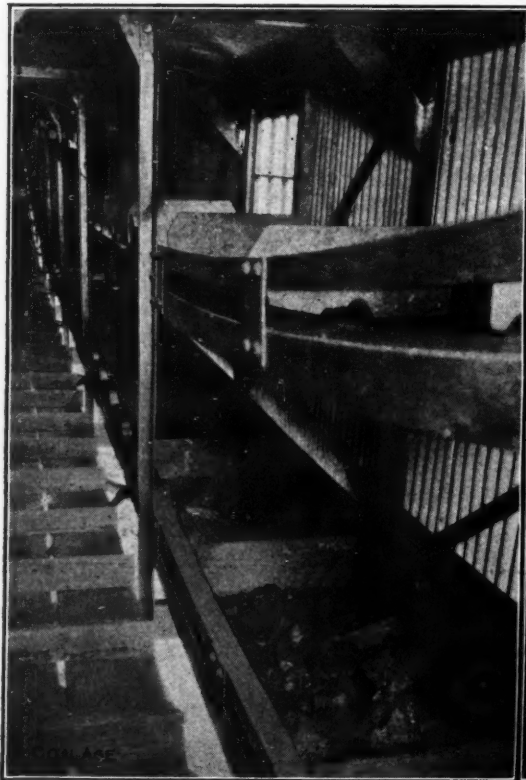
At first, until the retarding conveyor was installed, the middle-seam cars were hauled up the hillside to the



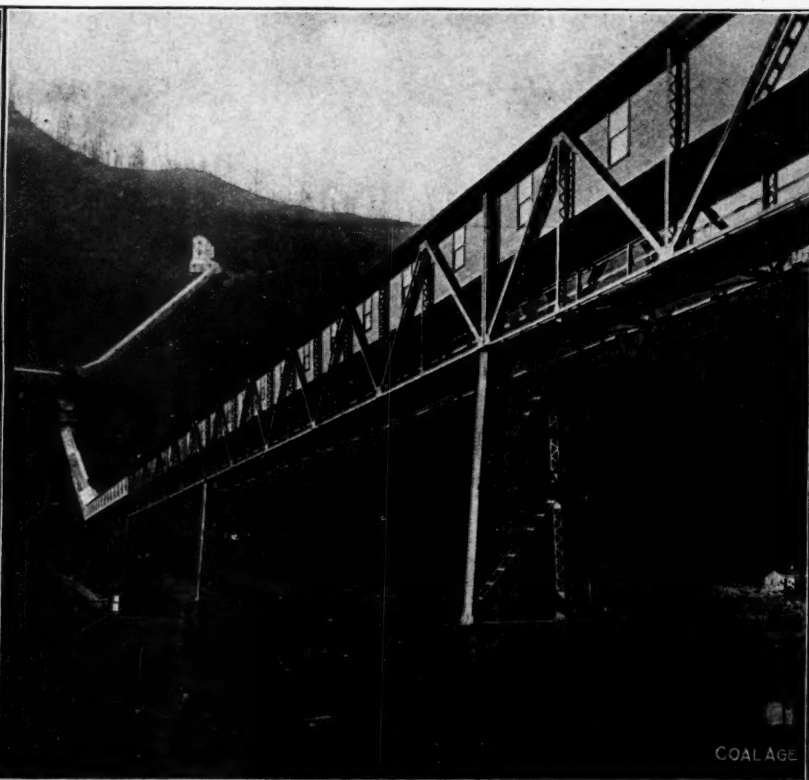
POWER HOUSE AND PREPARATION PLANT AT NO. 2 MINE

higher level, where they were dumped like those from the upper seam. The conveyor now lets the coal down to the lower mine level, where it goes to the same hopper into which the monitors discharge, and which feeds the apron conveyor extending across the river.

The retarding conveyor is of the flight type, and is fed by an apron conveyor beneath the hopper to which the middle-seam mine cars dump. It is 440 ft. long and



LOOKING UPWARD THROUGH THE
CONVEYOR HOUSE



SHOWING THE CONVEYOR SYSTEM AS IT SPANS THE
RIVER

is controlled by an electric motor, through worm gearing. Conveyor and feeder are geared together and operate as one, while the gravity action is such that the worm drive is in reality a locking device to prevent the conveyor from running away. The motor has only to rotate the worm and allow the conveyor to drive itself and its feeder.

The middle seam being thinner, smaller mine cars are used. At the lower seam, however, the cars are the same as for the top seam. Track gages and operative equipment are maintained the same for all three seams, giving advantageous interchangeability of both equipment and spare parts.

The shortwall type of mining machine is of even greater value in these thinner coals than in the thicker top seam. There is only one Goodman machine in the lower mine, while three are employed in the more rapidly developing middle measure. Thus there is a total of seven shortwall machines at No. 2 mine.

Gathering and haulage in both mines are accomplished by 3-ton locomotives. There are two of these machines at the middle mine and one at the lower.

There are, therefore, at No. 2 mine two 6-ton "2600" type and six of the 3-ton "1600" type, all of Goodman manufacture.

The Labor Situation

SYNOPSIS—*The Industrial Workers of the World are rioting in Belmont and Jefferson Counties of the State of Ohio, while the United Mine Workers of America actively oppose their propaganda of violence. In Oklahoma, it seems as if the union is itself responsible for the destruction of tipples by dynamite and fire. The Kanawha settlement being finally completed, the union purposes to extend the organization into the competitive Guyandotte Valley, where low wages rule. A meeting has been held by Socialists in New York City, urging the operation of the Colorado mines by the Government.*

No progress has been made toward a settlement of the strike in eastern Ohio and meanwhile rioting is becoming general. The violence seems not to be chargeable to the Union, at least as a body, but to the Industrial Workers of the World, because the local mine workers' officials at Bellaire, in Belmont County, have announced that after the present trouble is settled the miners who have participated in the disturbances of the Industrial Workers of the World will not be permitted to return to work as members of the Union and will be put out of the organization. The efforts of an Italian organizer of the U. M. W. of A. from the Colorado field have failed to pacify his fellow countrymen who are members of the Industrial Workers of the World. It is said that owing to their staunch adherence to law and order the miners' officials' lives have been threatened.

On July 15, 200 miners picketed the mine of the Fort Pitt Coal Co., near Bellaire, and prevented the company from carrying out its intention of starting the pumps and fans to clear the mine of water and foul air. Sheriff J. H. Anderson stated that he was unable to give the mine protection because the citizens refused to serve as deputies.

SHERIFF TAKES TARDY ACTION

The operators, prominently among them being the Lorain Coal & Dock Co., are still demanding of Governor Cox that he give them the protection of the militia, but he still insists that the sheriffs should prevent disorder. Major Harold Bush of the Ohio National Guard has spent several days investigating conditions in Belmont County as a confidential agent of the Governor. He reports that the sheriffs' powers are fully able to meet the situation. Governor Cox reprimanded the sheriff of Belmont County for not making more vigorous efforts to suppress rioting, pointing out that despite the fact that there had been a week's disorder not one arrest had been made. Finally the sheriff drafted 50 men and arrested 5 I. W. W. rioters who were attacking caretakers and engineers at a mine near Stewartsville. They were lodged in jail at St. Clairsville.

DISORDER SPREADS TO JEFFERSON COUNTY

But the worst disorder occurred in the neighboring county of Jefferson, which lies to the north of Belmont County. Here at Bradley, there was a spirited encounter between about 100 deputies and double that number of I. W. Ws. following an attempt to arrest ringleaders of the organization charged with riotous conduct.

Two or three hundred strikers kept their promise to Sheriff Huscroft and marched down from the hills intending

to drive out the pumpmen from the Dillondale and Rush Run mines of the United States Coal Co., near Bradley, O. Huscroft and his party met them and drove them back, arresting several. Bricks and stones were used by the rioters and Deputy Edward Lucas was severely injured. It is further stated that the sheriff and three deputies were struck with clubs. The miners retreated to their houses and a number of shots were exchanged. The women were used as shields by the I. W. Ws. They used both clubs and stones and threw pepper and salt into the eyes of the deputies.

A number of operators with headquarters at Cleveland, O., signed a communication to the governor on behalf of practically all the eastern Ohio operators to the effect that they have complied with their agreement with the miners' union and have not laid off any Union pumpmen and engineers at the mines. He had asked for information as to this fact, John Moore, the state president, having declared that nonunion men were replacing members of the organization in pump and repair work.

IMPURITY AND SLACK MAXIMA DELAY SETTLEMENT

Arrangements have been made for holding conferences of operators in the Hocking Valley and Jackson subdistricts, July 20; in Crooksville and Lawrence County, July 23, and in Pomeroy and Massillon, July 27. These conferences are for the purpose of agreeing on working conditions and the rate for day work and also to try to arrive at an adjustment of the percentage of impurities and fine coal to be allowable under the new mine-run law.

It was believed for a time that work could be resumed July 20, but when that time approached it was found to be out of the question. Much new ground is to be covered in the negotiations and consequently more time was required than at previous agreements. Work is expected to be resumed in all the districts which have signed the scale by Aug. 1, if not earlier.

UNION VIOLENCE IN ARKANSAS

The situation has become more severe and the Union may be as blameable in Arkansas as it is commendable in Ohio. On July 17, fire and dynamite were used to destroy 4 tipples, 2 fanhouses, a store and boarding house of the Mammoth Vein Coal Mining Co. at Prairie Creek, Ark. Some mine guards were killed and some are missing. How many men have been killed was at the time of writing uncertain, but the bodies of John Baskin and Clarence Stylesberry have been found and the coroner was holding an inquest over their bodies. According to the affidavit of L. C. Thomas, also a mine guard, and a participant in the fight, he and six other guards left the mine when the fighting was at its height and tried to break through the attacking party.

They were captured and removed to a log house in the woods and held for hours till the state officers arrived. Then it was that one of the Union men shot Baskin and as he fell fired at Stylesberry, sending another bullet in the body as the latter tumbled over.

Eight warrants have been issued by Federal Judge Youmans charging violation of the court injunction. The sheriff of Sebastian County, Lon Norris, and Paul Little, the attorney for the state, are investigating the battle.

Twice recently the mining camp of Frogtown, near Prairie Creek, was shot up and it is reported that another attack was made on the 16th. The wires being down, news is difficult to obtain. The property loss is estimated at \$200,000.

As a result ten men have been arrested for inciting a riot and warrants have been issued for twenty more. Seven men in addition who were employed at No. 4 and are said to have engaged in the fight have been arrested charged with a breach of the peace.

The Coronado mine, also belonging to the Bache-Denman Coal Co. and located a mile west of Huntingdon was dynamited and completely destroyed on July 20. Thus in less than a week this corporation has lost the Mammoth Vein mines, mines Nos. 3 and 4 and the Coronado plant.

KANAWHA STRIKE ENDED

It seems permissible at last to record that the Kanawha strike in West Virginia is at an end. On July 15, by a vote of 4 to 1, the delegate convention of the United Mine Workers of America, No. 17, voted to accept the proposition tentatively agreed upon by the miners' representatives and the Kanawha Coal Operators' Association. Every clause was submitted to vote separately.

The contract provides for the check-off, which was first granted in 1903 and surrendered in 1906; for a wage scale for outside workers; for the extension of the 1912-1914 Kanawha wage scale and for the elimination of the discrimination clause. Every clause was carried by a substantial majority and no amendments were made. If the union men are opposed to the check-off, as was alleged by the operators, that fact did not show in the voting, as 43 voted for it and 3 against it.

The hand pillar-drawing rate in the gas seam has been left to local adjustment. It must not, however, be less than 40c. per ton. In the splint seam, the same rate has been left to local determination and must not be less than 46c. It has hitherto been 56½c. per ton. In some places this coal is much easier to mine than it is in others and this fact is expected to operate in the adjustment of the scale. The docking rate for dirty coal is reduced from \$1 to 50c. for the second offense.

OTHER DISPUTES IN KANAWHA FIELD

The miners claim a victory in securing the check-off and the operators are successful in getting a 3-year settlement. About 200 miners are on strike at the Montgomery and Eureka mines on Morris Creek; and the Winifrede and Belmont mines of the Winifrede Coal Co. are idle owing, it is said, to a lockout, but the lack of orders may be the cause of the idleness.

No contract has yet been signed with the Four States Coal Co. at Dorothy, or with the Milburn Coal Co. on Paint Creek, but the miners are working at both operations pending an agreement.

THE GUYANDOTTE VALLEY TO BE UNIONIZED

A scale being arranged on the Kanawha, the union officials will turn their attention to the unionizing of the Guyandotte valley plants in Logan County. The Guyandotte, it will be remembered, enters the Ohio a few miles above Huntingdon and runs on a course roughly parallel to the Kanawha except at its headwaters in Wyoming and Raleigh counties. At present only about 3000 to 5000 men are employed, but it is expected that before long 10,000 men will be engaged. The companies operating are still small except the United States Coal and Oil Co. at Holden, W. Va., and the Monitor Coal & Coke Co. Island Creek No. 1 of the former company produced the second largest tonnage of any mine in West Virginia in 1912.

So far the success of the union in West Virginia has been with the smaller companies. It is now purposing to pit itself against a company of financial strength. The mines of the United States Coal & Oil Co. are in the No. 2 Gas seam, as are most of those in the Kanawha valley, and the company has been a strong competitor of the Kanawha operators, as its rates are lower than those paid by them, its mines being run on a nonunion basis.

FEDERALIZING COLORADO MINES

Probably some will be disposed to lay much emphasis on the meeting held in Webster Hall, July 17, to protest against the coal companies in Colorado and to demand the acquirement of all the mines by the federal government and their operation by the United States or by lease under severe restrictions. As a matter of fact, there is in the meeting no new menace to capital. The parties who advocated the action were all recognized Socialists except a few who kept well in the background and did not speak at the meeting. In fact, there was a general note of apology for so mild a resolution and almost everyone who spoke wished to explain that for years he had believed in state ownership undiluted for all public utilities, and some were evidently uninclined to stop at the acquiring of the establishments of public service corporations and desired to enjoy the parlor pleasures of unmitigated state socialism.

Dudley Field Malone, collector of the port of New York, who was said to be on the committee, did not attend, so the federal administration was in no way represented. Benjamin C. Marsh presided and he read Amos Pinchot's attack on the Colorado Fuel & Iron Co., a somewhat conservative statement in which he declared that according to the admissions of the company officials that corporation had been slow in complying with the Colorado State laws which evidently they regarded as class legislation. He did not declare that they were now violating the laws of Colorado.

Hugh Frayne, New York representative of the American Federation of Labor, then spoke, stating that John D. Rockefeller by a word could have prevented the bloodshed in Colorado. We much doubt if he could have done so permanently, but whether property owners are to listen to the cry to prevent bloodshed by surrendering when the malcontents break the peace is a question to be determined when all the facts are known.

There is something childish in Frayne's statement. There were other ways of avoiding bloodshed. Certain Greeks and Bulgarians, for instance, could have given up their guns and permitted those men who would, to go to work without improper interference. Had the Colorado union officials behaved as well as the mine leaders in Ohio, there might have been no Ludlow.

JOHN W. BROWN AND MOTHER JONES

Then followed the interesting Meyer London, who has a congressional position in mind. John W. Brown, one of the leaders of the miners in Colorado, made a mild address on the economic condition in the mines of the state. He got not a little applause, but only because he made a few purely socialistic statements. Mother Jones' witticisms and sallies were loudly applauded, as also her stories about her dogged obstinacy and her determination to go back to Colorado "next week" and make trouble.

She said she came to talk about the "babies" who were roasted by the operators and whom she knew and had learned to love on her previous visit. All this "sob talk" utterly failed to create an impression, because it did not concern socialism; beside it was all untrue and the people knew it. The story of the father going back to the militia camp for his boy who had been missing and having the boy's headless, half-burned body thrown over to him with the words, "Here, take the damned thing," was not even told, and had it been told would not have been believed. Mother Jones stormed at those present because they had not started a revolution to avenge the wrongs of the "babies," but reiterating the word "babies" did no good. Let no one think that any body of citizens believes the babies were deliberately burned. Only those will credit the militia or operators with it who are capable of doing it themselves and there were probably none in the audience who could be conceived as ever being engaged in such villainy.

Senator Martine was fairly well received, though those of our readers who have heard him and his moss-grown oratory will hardly credit the statement. He talked mainly on himself, his beliefs and services, and on the West Virginia situation. He declared he had believed in public ownership of utilities for forty years. Like everyone else, he showed that he did not believe that the action called for was one arising out of the peculiar conditions in Colorado.

WHY ARE COLORADO MINES CHOSEN FOR SOCIAL EXPERIMENTS?

The motion was finally put, but Marsh had to explain that it had been hard to agree on the nature of the resolution. It was clear that some objected to it because, as they would express it, it would "only replace a soulless corporation by a soulless government." Besides, others objected because there was an inference that the government would pay for what it took. Do not the Socialists rather desire to tax the value out of all property before annexing those properties for the public? Also, was Socialism not asking for a small part only of what all the Socialists desired in far greater measure? Hence Marsh thought it necessary to apologize for the half-hearted resolution. The voting was strongly in favor of the motion, though it was not enthusiastic for the reasons given.

The audience was a respectable working-class assemblage. The men and women were of a self-respecting kind, mostly English-speaking foreigners, all orderly and above the average of citizenship. It is a pity that to such an audience a reasonable argument could not be presented such as would convince them of the essential soundness of a less radical program and would assure them that at present real social self-immolation is so rare among workers and capitalists that it is not safe to base our civilization on its existence.

Electricity in Coal Mining

BY DAVID R. SHEARER*

SYNOPSIS—This is the last article of the series on this subject and treats of the application of electricity to purposes of mine ventilation and drainage. The centrifugal pump, on account of its high operating speed, is admirably adapted to direct connection to a motor shaft.

It has been necessary since almost the earliest developments in coal mining to use some type of device for securing a circulation of air throughout the different parts of the mine. Since both men and animals are working underground in comparatively restricted quarters, the oxygen would soon be consumed from the air and replaced by gases dangerous to health and life, even if gas were not constantly escaping from the coal in many mines.

The earliest systems of mine ventilation were based on the principle of chimney suction. Tall stacks were built from which an air duct led into the mine so that when fires were kept burning in the chimney a continual draft of air was being sucked out of the workings and carried up the chimney.

This method was necessarily both cumbersome and expensive and was soon replaced by large fans and blowers driven by steam engines or some other form of power. If steam engines were used and the fan located at a distance from the boiler, large losses from condensation occurred in the steam pipes. The normally low speed of the steam engine made necessary the use of very large fan wheels, which called for expensive housings and heavy foundations.

Upon the advent of electrical power for mine operation the electric fan rapidly came to the front, and at the present time it is used almost exclusively where current is available. Electrically driven fans are of many different forms and operated by various types of motors connected in some cases by belts, chains or gearing or more usually mounted on the motor shafts.

When a ventilating fan is of such design that it may be mounted in this manner a high efficiency is secured with practically no noise and very smooth operation. Since a fan must be operated continuously a small gain in economy means a considerable saving in power consumption, and since even a short stoppage of the fan would result in danger to those working in the mine, it is necessary to have the very best driving equipment possible.

The direct-connected motor meets these conditions admirably, for not only is it economical, but subject to little danger from accident or wear. The motor-driven fan being usually run at high speed is compact and easily moved when necessary. When a change of location is found to be desirable, the feed wires may be quickly taken down and erected at a different point.

If electric power is available and a fan be subjected to some accident, it is possible to install temporary equipment quickly, fed from the distributing lines to take the place of the disabled machine.

Where alternating current is available, perhaps no better method of driving a fan may be found than the use of a squirrel-cage induction motor, since these machines have no open contacts, no sliding brushes or commutator

and consist of only two parts, the rotor or rotating member and the stator or machine frame, upon which the windings are placed. Such a motor will operate continuously and economically with practically no attention except an occasional oiling. Direct-current motors, however, are quite satisfactory in several types when alternating current is not available.

PUMPS ALSO HAVE HARD, ROUGH USAGE

Another class of mining machinery upon which devolves hard service is the mine pump. Pumps are placed in service for two purposes, to supply water to the boilers or for domestic use and to pump out the water accumulating in the lower levels of the mine.

Many different types of pumps are found in common use, the geared single-action, duplex, triplex and multiplex, centrifugal and positive rotary. Each of these types has certain advantageous points for working under certain conditions, and it may be necessary to use several types in one mine to meet the varying requirements. Probably the most satisfactory pump for domestic and boiler service is the plunger type, either simplex or duplex, operated through spur gearing by an electric motor.

Here again the induction motor makes an excellent driving power, since it operates smoothly and with practically no attention. This machine is less affected by dampness than any other type and cases have been known where a squirrel-cage motor continued to operate after being submerged by several feet of water for five days, or until it had pumped all the water out of the shaft in which it was located, and this without injury either to the motor or to the pump.

It is possible to use a motor on a small pump that may be thrown directly across the line without injury, but those of a larger size require some form of starting device. This may be either hand operated or entirely automatic. Thus, a pump may be located at a long distance from the power house and yet be readily controlled from this point.

In the case of domestic water supply the operation of the pump may be made entirely automatic by a float-switch mechanism, so that when the water drops to a certain level in the tank, the motor is automatically started and pumps until the tank is filled to a predetermined point where the float throws out the switch and stops the pump. Frequently an arrangement of this kind is used in the lowest level of the underground workings, so that when water rises in the sump to a given point, the motor begins work and pumps the water out without any attention whatever.

PISTON PUMPS ARE SUBJECT TO RAPID WEAR

Although the piston pumps are quite efficient in handling water, they are subject to rapid wear from mud or grit and frequently a few months' operation either wears out the valves or cuts the cylinder so badly that a new pump is made necessary. To obviate these troubles, many types of centrifugal pumps have been brought out in which there are no valves and no sliding surfaces exposed to the gritty water.

The principle of operation in these pumps is as follows:

*Schaum & Uhlinger, Philadelphia, Penn.

The pump casing being full of water, the impeller in rapid motion tends to throw the water outward by centrifugal force and as the only outlet is the delivery pipe at some point in the circumference of the casing, the water is forced out through this opening with considerable velocity and is replaced by suction with more water admitted to the center of the impeller.

One marked advantage in this type of pump is that owing to a high speed being necessary, they may be connected directly to an electric-motor shaft without intermediate belting or gearing. Many of these pumps are mounted direct on the motor base so that the whole forms a self-contained unit and may be moved from place to place readily.

PECULIAR FEATURE OF CENTRIFUGAL PUMP

A peculiar feature of the centrifugal pump and one that is directly opposite to that which exists in the piston or plunger type, is that when the discharge pipe gate-valve is closed, the pump impeller runs light and without taking excessive power, but as soon as this valve is opened, the pump assumes a load. If the gate valve were closed on a plunger pump when it was running, either the pipe or pump would be broken or the driving power would be stalled, since such a pump is positive in action.

Another type of pump used to some extent where pure water is to be forced from one level to another is the

positive rotary pump, which usually consists of some form of gearing or wheels which mesh together in such a manner as to create a suction in one side of the casing and a pressure in the other. This type of pump runs at a higher speed than the piston pump, but lower than the centrifugal and is not employed to any great extent in mine work.

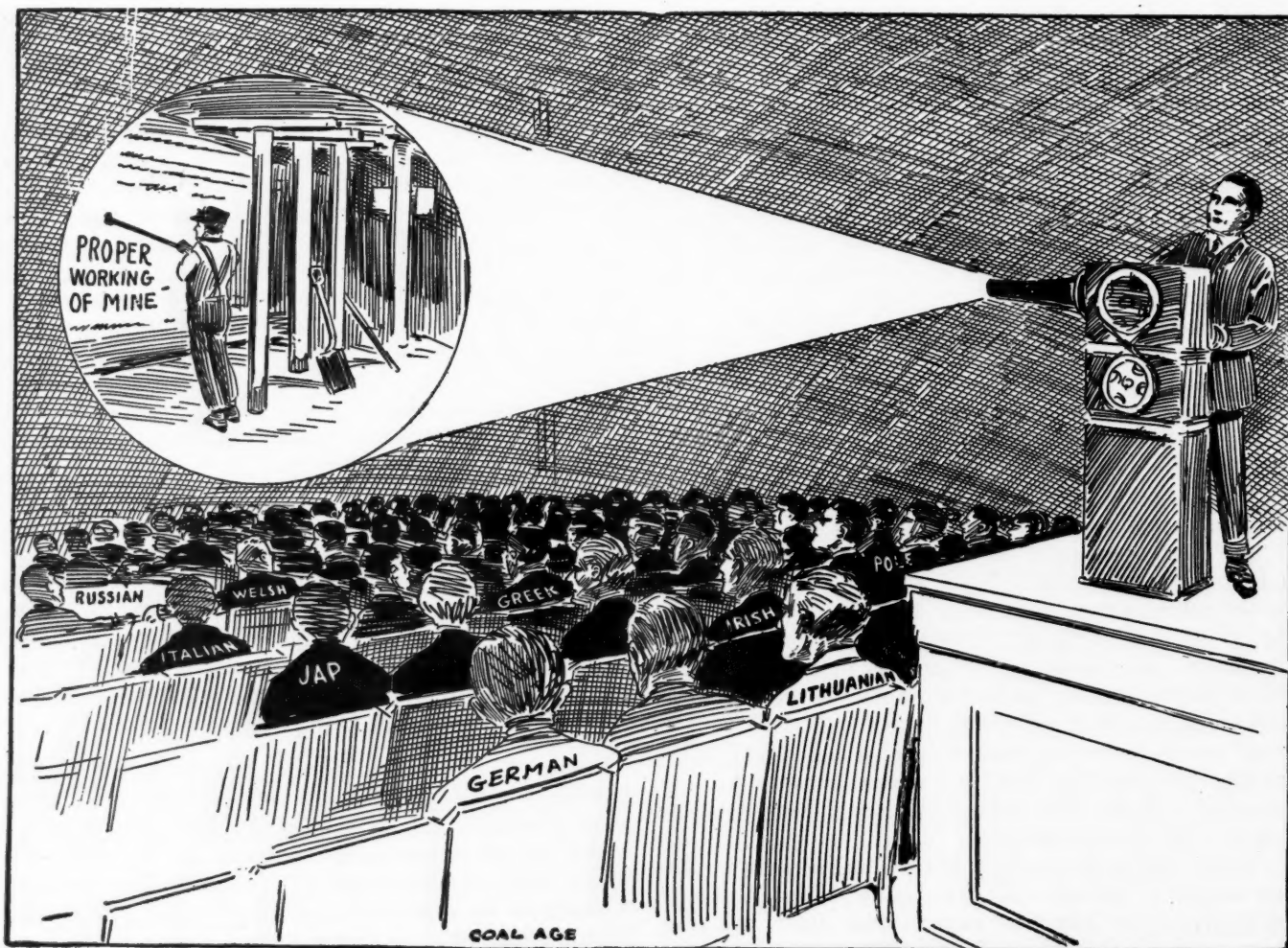
As a usual thing, it is advisable to use a motor about twice the size theoretically necessary to drive a given pump, since considerable losses occur both in the pump proper and the pipe lines. If the pump is of the piston type driven by intermediate gearing, considerable power is lost in the transmission, so it is best to dispense with all gearing except that absolutely required.

The theoretical power necessary for pumping purposes may be found as follows: Multiply the height of head in feet by the number of gallons to be moved per minute and this product by $8\frac{1}{3}$, dividing by 33,000. This gives the theoretical horsepower, which should be multiplied by 2, in order to find the size of motor necessary.

✠

The Summer Meeting of the Pennsylvania Anthracite Section of the A. I. M. E. will be held this evening (Saturday, July 25, 1914), at 7.30 p.m., following an informal dinner at the Pottsville Club, Pottsville, Penn. William G. Whildin, mining superintendent of the Lehigh Coal & Navigation Co., will present a paper on "Steep Pitch Mining of Thick Veins," and informal discussion of the paper is invited. Charles Enzian is secretary.

✠



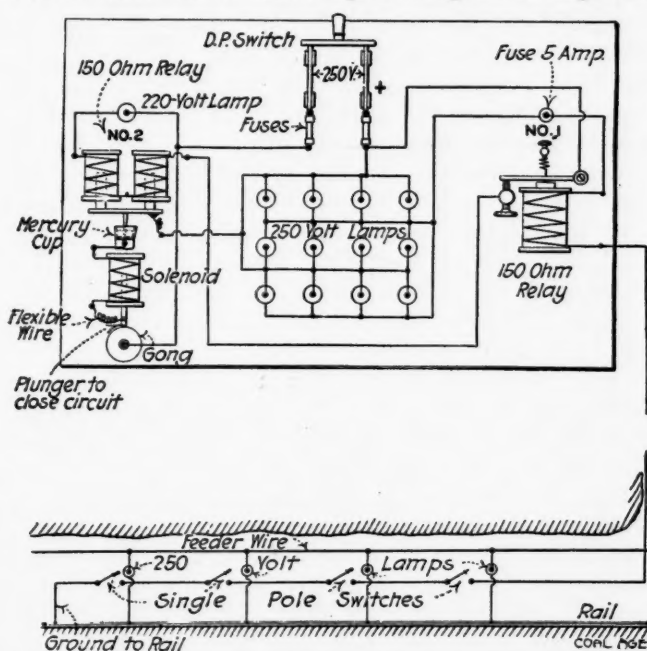
THE UNIVERSAL LANGUAGE THAT GIVES IMPETUS TO THE "SAFETY-FIRST" MOVEMENT IN COAL MINING

A Good Signal System

BY JAMES McCUNE*

For the benefit it may be to others operating under similar conditions, I submit the accompanying diagram of a wiring system that I installed, several years ago, in a mine in the Birmingham district, in this state. Although the mine is not working at the present time, the signal system to which I refer worked satisfactorily for two years previous to shutting down the mine. To my knowledge, the system never gave the least trouble in its operation, during that time.

I will attempt to describe the system as clearly as possible. The switchboard, which was located on the surface, was designed so that the signal gong could be rung by opening any one of the single-pole switches, which were located about 100 or 150 ft. apart along the haulage road



AN AUTOMATIC DANGER SIGNALING DEVICE FOR MINES

in the mine, as shown in the diagram. I used a single wire, No. 14, B. & S. In order to use the 250-volt power circuit, for this purpose; twelve 250-volt, 16-cp. lamps, in series parallel, were cut into the circuit to reduce the line pressure to about 20 volts with a current of 3 amperes. This current was conducted through the 150-ohm relay No. 1, as shown in the diagram, from whence it passed into the mine.

As long as the mine circuit remained unbroken, No. 1 relay being in the circuit was active and permitted the current to pass likewise through the branch circuit that energized No. 2 relay, shown on the left of the diagram. This relay (No. 2) being thus active held the needle suspended above the cup of mercury, thus keeping open the circuit for operating the signal gongs.

If, now, the mine circuit was broken by the opening of any one of the single-pole switches in the mine, or by an accidental fall of roof, or other cause, No. 1 relay was at once rendered inactive and the branch circuit was thereby instantly broken which, in turn, rendered No. 2 relay inactive and permitted the needle to drop into the mercury cup. This closed the circuit passing through the gong, which was thus thrown into action and continued to

*Yolande, Ala.

ring until the main circuit was again closed, when it would cease.

The operation of the secondary circuit to ring the gong continuously is well understood. The gong is rung by the plunger striking against it whenever the solenoid is inactive; but the instant the plunger touches the gong, the circuit is again complete and the plunger is drawn back into the solenoid, which again breaks the circuit and again the plunger strikes the gong. The action is thus an alternate making and breaking of the secondary circuit, which produces a continuous ringing of the gong as long as this circuit is closed.

When this system was first installed, I expected that some trouble would arise from the excessive heating of the relay coils, but this fear was not realized. As an extra precaution, an incandescent lamp was introduced into the circuit above relay No. 2 and served to show, by its burning, that the main circuit was unbroken. Lamps were also introduced into the main circuit at each switch in the mine, and these served both to light the roads and to locate the switches.

Kansas Mines More Coal

The coal miners of Kansas, according to E. W. Parker, of the U. S. Geological Survey, working in coöperation with the Geological Survey of Kansas, produced 7,202,210 short tons in 1913, valued at \$12,036,292. This was a substantial increase over 1912, especially in the value of the output, which advanced more than 6 per cent. The production of the former year was 6,986,182 short tons, valued at \$11,324,130.

The coal-mine operators of Kansas had little of which to complain during the year. There was no serious trouble with labor, railroad consumption increased somewhat on account of the strike in Colorado mines, transportation facilities were satisfactory, and the demand for steam coal, for manufacturing and domestic fuel generally was well up to the supply. The only unfortunate incidents were occasional shut-downs, at the stripping operations, because of high water in the spring, and some inconvenience during the summer and early fall when boiler water had to be hauled. Shooting from the solid continues to be practiced in the coal mines of Kansas.

It Is Important

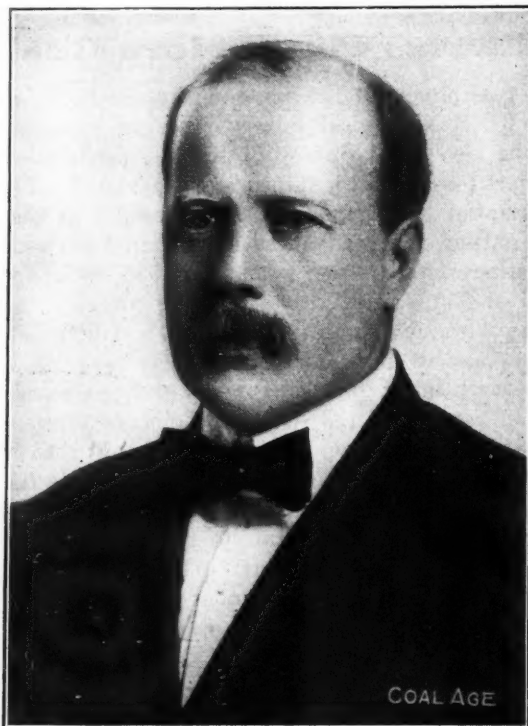
That you should read the "Extracts from a Superintendent's Diary," published in COAL AGE each week. This brief article contains a lot of good common sense. One subscriber says: "It seems like a page from my own experiences." We also suggest that you carefully examine the next issue of COAL AGE and read the following articles: Engineering Practice of the Consolidation Coal Co.; An Endless Rope System for an Inclined Plane; Sanitation and Simple Ways of Making It Effective at Coal Mines; Flameless Surface Combustion for Boiler Heating; Substitutes for Wood Timbering in Mines; Costs and Application of Piping at Coal Mines and a Description of a Particularly Well Executed Shaft-Plumbing Operation. There will also be several feature articles that will hold your closest attention, and one of the best poems Mr. Braley ever turned out. In short, the Aug. 1 number will be the most interesting issue of COAL AGE ever printed.

Who's Who in Coal Mining

John Dunlop

One of the many ambitious men who have figured in the coal-mining industry, and who have given generously of their time and talents to the building up of that industry in Illinois is John Dunlop, former state mine inspector and, at present, inspector for the Safety-First Mine-Inspection Bureau of the Peoria district.

Mr. Dunlop was born at Annick Lodge, Parish of Irvine, Ayrshire, Scotland, 1864. Educated, at first, in the common schools of Scotland, he entered at an early age, Kilmarnock Academy. Mr. Dunlop early showed a deep interest in all that pertains to coal mining. He joined the classes which were at that time conducted as the Science and Art Department and under the administration of the Government. By his devotion to study and



JOHN DUNLOP

constant application, he received from those schools four diplomas. The instruction included a thorough course in mining engineering.

At the early age of 23 years, Mr. Dunlop came to the United States and located first at Clay City, Ind., where he remained for a few years before making Illinois his adopted state. In 1892 Mr. Dunlop took the examination for mine manager, before the State Mining Board and passed with high credit. The following year he secured the appointment of mine manager for the Pittenger & Davis Coal Co., Centralia, Ill., which position he held for five years.

Again, in 1897, Mr. Dunlop went before the State Examining Board and passed successfully the examination for state mine inspector, to which position he was appointed by Governor John R. Tanner, being assigned to

the Sixth Inspection District of the state. He was re-appointed, successively, by Governor Yates and Governor Chas. S. Deneen. In the year, 1908, Mr. Dunlop was employed by the Marion County Coal Co., to sink several shafts near Centralia. But, in 1909, he again entered the state inspection service and was assigned to the Third Inspection District, at which time he located in Peoria.

EFFECT OF CHANGE IN ADMINISTRATION

Owing to a change in administration and the divorcement of the mine-inspection service in the state from civil-service control, all the state mine inspectors of Illinois, with one exception, failed of reappointment, Mr. Dunlop being among the number. This universal change in the inspectorate of the state was the result of a purely political upheaval. Mr. Dunlop's ambition would not permit him to remain idle, however, and his ability as a mine inspector and instructor in coal mining brought him the appointment of inspector for the Peoria District Safety-First Mine-Inspection Bureau. This is an organization made up of the following operators of that district: Crescent Coal Co., Clark Coal & Coke Co., Logan Coal Co., Groveland Coal Co., Tazewell Coal Co., Warsaw Coal Co., Newsam Bros. Coal Co., Brewster & Evans Coal Co., all in the Peoria district.

Since taking up this work, Mr. Dunlop has manifested his usual energy and made a thorough inspection of the mines of these companies. He has given much personal instruction to the men in the mine, whereby we may hope he has greatly reduced the liability to accident. Not satisfied with performing his duties as inspector of mines, Mr. Dunlop has organized and successfully conducted large classes in coal mining, in connection with and in addition to his other duties. That this work of instruction has been eminently successful goes without saying. Mr. Dunlop is a close student of mining and thoroughly acquainted with the theory as well as the practice of mining coal.

At the last meeting of the Mine Inspectors' Institute of the United States of America, Mr. Dunlop was chosen president of the Institute, of which he has been a member since its organization. This meeting was held June 9-12, at Pittsburgh, Penn. The next meeting (1915) will be held in St. Louis, Mo.

Marketing Waste Gas at Birmingham—A controversy developed between the city of Birmingham and the Birmingham Railway, Light & Power Co. over the proposal of the company to furnish byproduct gas to the city from the coke ovens of the Tennessee Coal, Iron & Railroad Co. Under the proposed contract the gas company would have furnished the gas at an average reduction of about 18c. a thousand to the city consumers, but the city officials stood out for a lower price on the ground that the gas was a waste product, and their stand has resulted in Birmingham failing to secure the cheaper gas. George Gordon Crawford, president of the Tennessee company says that between the coke ovens at Fairfield and the steel mills of the company at Ensley there is a 24-in. pipe line $2\frac{1}{2}$ miles long connected to two compressor stations, one of 25,000,000 cu.ft. daily capacity and the other of 30,000,000 cu.ft. daily capacity. The gas is compressed and forced through the mains to Ensley, where it is used under boilers and in the open-hearth furnaces and soaking pits, displacing coal. The company has spent over \$140,000 in piping this gas to its steel plant and could use to advantage several times the present quantity of gas in its plants.—"Wall Street Journal."

Editorials

The General Labor Strike

The British Columbia Labor Convention decided on July 15 to call a general strike of all the labor forces in British Columbia, because of conditions which have arisen out of the miners' strike on Vancouver Island. A referendum will be necessary to make the decision effective, and this will prevent a strike for at least six weeks.

We shall overlook the fact in these remarks that such a strike would be against the laws of British Columbia, where both strikes and lockouts are regulated, but as this foolish European method of settling a dispute may eventually be imported into the United States, where it is not illegal, it may be well for us to show that general strikes are against the welfare of the workingman.

The British Columbian store clerks and lumberjacks are seeking to strike to raise the wages of the miners and therefore the price of the coal they use. After a while they will ask the miners to strike with them to raise the wages of clerking and lumbering, thus increasing the price of the goods the miner buys and of the lumber he uses. All this would be a diverting pursuit of increased wages and decreased purchasing power, and would work no one any harm if it were not for two considerations; one, that no one will pay store clerks, lumberjacks and miners when they are idle, so that they all alike will all lose; and, two, that if the wages get too high in that "tight little island," no one will be willing to pay for the goods it produces.

The general labor strike is a folly. It is as if the hands of all mankind banded together and entered into conflict with their heads. Surely no good could come of such a quarrel, for the happiness of man is bound up in the union between the man's head and his hands in which both help each other. No good could come to the hands if all the heads were beaten to a jelly, while on the other hand the feeling of a single head and a pair of hands might be transcendently jubilant if all the other heads and all the other hands needed triangle bandages and splints.

The important solidarities of mankind are industry bonds rather than class bonds, though in a regrettable way employers unite against workers and workers against employers. Moreover, when solidarity is rightly attained, there will be no private interest either of class or of industry. The happiest individual would be the man who could live where all are prosperous and all have the adroitness of mind and cheerfulness of spirit which comes from well remunerated toil.

Strikes are generally believed by the advocates of trades unionism to encroach on the profits of capital, and indeed they did so when they did not involve the whole industry at one time, for then they merely brought the wage scale of one factory or mine up to that of its competitor, but now that they are almost national in any one trade their effect is almost always to raise prices to the consumer and to upset the balance of living of other workingmen. The labor conflicts of the twentieth century

are apt, like the national wars of the seventeenth and earlier centuries, to plunge the world into a needless penury.

We must never forget that though these later conflicts destroy but little and though the efficiency of the workman is continually on the increase, his comfort and wealth must be immensely depleted if he is to produce only a short part of the year. And moreover, it is likely that because the populousness of the world is continually on the increase there will be an increasing need to build up the capital of the race in order to make possible the utilization of lands and mineral deposits of inferior value. This cannot be done if the people are to reduce their productivity by idleness of a character which does not add to their efficiency.

But This Is about Oil

We wish that we could take some hope from the facts we are about to relate, but the story is about other fuel than coal; it is about oil. It has been rumored that the small oil man needs help though his smallness is only relative. His profits have always been large and the extravagances of men made rich by oil have passed into a fable. No one has discussed the tips, the libations and the follies of the coalman. He has rather been represented as miserly and grasping. The reason is clear; he has not been empowered by his wealth to be liberal and to scatter his coins like a princeling to the people on the street.

But we do not pretend to understand the difference between oil and coal. When crude oil rises 100 per cent. in a few months, everyone says "Good for the oil man; that will help the producers." At the same time, coal is raised 10 or 12 per cent., and the remarks on the street are too contemptible for repetition. We will be frank; we cannot tell where the difference arises. Even when wages are increased, the people grit their teeth and say coal should not increase in price, yet on the other hand, crude oil always rises on the principle enunciated in the motto "Make the traffic pay all the traffic will stand."

In the progressive state of Oklahoma, there is a Corporation Commission which has been regulating matters of all kinds in a high-handed manner. Some time ago, someone complained that gasoline was too high in his little village and he desired the commissioners to order a reduction in price. From that time on the Commission has been busy with oil questions. The producers declared the Trust was discriminating against their oil, that it was not supplying pipe-line capacity to take care of their product, was endeavoring to "freeze them out" and was, moreover, producing as well as selling oil.

At first the Commission attacked the pipe-line companies and then suddenly finding that too much oil was being produced and that the price would certainly fall and more oil would be for sale than would be needed at the terminal points, deliberately threatened to cut off the production from such wells as were drilled contrary to their orders, and ceased to berate the Trusts for not doubling their line capacity.

So they made these rules which we do not quote verbatim, as they are most ineptly worded:

It is therefore ordered that the Texas Co., the Gulf Line Co., of Oklahoma and the Prairie Oil & Gas Co. shall be relieved as common purchasers from taking the production of any wells brought in, on or after July 1914, except:

(1) Wells where the lease conditions require drillings within a definite date. Such wells shall be drilled on the lease at a point where it will not be necessary for adjoining properties to offset the same. [That is, they must be drilled so far from the property line that they will not draw the oil away from under a second property.—Ed.]

(2) Wells on properties which have no production and adjoining properties which may have a tendency to drain same, even though they would not come strictly under the offset rules.

(3) Wells which are now being drilled.

(4) Wells necessary for opposing the draft of oil by producing offsets.

(5) Wells drilled on short-term leases to comply with Federal court orders where receivers have been appointed.

Furthermore, they also exempt the pipe-line companies from taking oil from any well "squibbed or shot" to the Bartlesville sand in the Cushing field during the period of exemption and order that the companies transporting oil, shall not be required to accept oil from any new well drilled under the five exemptions listed above if, being drilled in the Cushing district, it goes more than 60 ft. into the Bartlesville sand, unless the Commission orders otherwise.

The whole of this restrictive action is alleged to be with the idea of conserving oil, but is really provided to keep up the price and the commissioners are at no pains to deny that the order is made to help the producers, and in answer to their clamor. They have declared that if the producers will not help enforce the regulation, the Commission will let the whole matter severely alone, that is, let the oil be wasted; so little are they conservationists. They are afraid oil might fall to 3c. per bbl., as it did at one time in Texas.

But let us not suppose the Oklahoma producers are losing money, not at all. The papers are full of records of the fortunes being made, and those producers who are not able to take advantage of the prices liable to be artificially created, are not pleased that they cannot sink enough wells to get a plethoric fortune.

If the opening of new coal mines were forbidden, the miners would not realize any noticeable restriction of the opportunities to labor because the work of opening is a small item compared with that of operating. But the oil industry is self operating in much of the Cushing field and will not need even dynamiting if in the Bartlesville sand. In fact, only one well reaching down to that sand has needed to be so treated. Consequently all the work in the field consists in drilling and preparing to drill, and the restrictive order has laid a number of men idle.

But what does it matter, the oil interests must be appeased. The poor oil millionaires must make money; the market must not be demoralized. Oklahoma, the great baiter of the trusts, has now taken thought and has created a trust more discreditable than any which has ever preceded it, and has chosen for its ill advised action, that business which has led to fortunes which have been the wonder of the world and in a field where the production has been more prolific than in any other state.

And the moral is clear. The Oklahoma oil producer has continually urged his rights on the legislature, has published his hopes and fears broadcast, has in short, advertised his woe. He has always had a grievance and at last, he has found in Commissioner Henshaw, a sym-

thetic listener. We believe he has been too successful and that his profits have been excessive, and it is probable that in a few months, the action of the commissioners, producers and pipe-line men will be rightly condemned. The better plan would have been to have required that every producer be ordered to provide storage for his oil or leave it underground.

A Contrast

Julian Street, writing in *Collier's*, quoted Henry Ford, the builder of the popular automobile, as follows:

We've done two hundred and fifty millions of business to date. Our profits have amounted to about fifty-nine millions. About twenty-five per cent. has been put back into the business—into the plant and branches. All the actual cash that was ever put in was twenty-eight thousand dollars. The rest has been built up out of profits. Yes; it has happened in a short time; the big growth has come in the last six years.

This may well be called making money. We are constantly reminded that coal men seem prosperous, have fine houses, and must make money somewhere if not in coal mining. Howbeit, we have never noticed anything striking in the residences they erect. But did one ever hear of a coal corporation starting with \$28,000 and after only a few years, acquiring from profits a plant worth roughly \$15,000,000, having paid meanwhile about \$44,000,000 in dividends? In fact, the talk about coal barons is extremely misleading. In no business have profits been so small and uncertain, and surely all the coal companies have not been badly managed.

The time has certainly come when other corporations than coal and public-service companies receive a ray of the fierce light of investigation. Surely there is no reason why those who render an essential service to humanity should receive all the abuse, should be forbidden to protect themselves by reasonable combination, and should be considered fit subjects for restrictive laws.

The logic of the situation urges everyone to seek his profits and his living in providing for the luxuries and in meeting the extravagances of the multitude, and not in supplying them with staple articles on which their real happiness depends. Moreover, as a corollary we may ask whether manufacturers whose profits are so unreasonable, have any right to demand of coal men that they either operate their mines continuously, conceding all the demands of their employees, or else turn their holdings over to the state.

With such magnificent profits as the manufacturers often secure we cannot wonder that they feel they are the chosen of the nation, nor can we marvel that like spoiled children, they sometimes make imperious demands. When they themselves make such fair profits it is easy to explain how it is they always imagine the coal man has a princely surplus to divide with his employees.

Dr. George Halberstadt, who is at the head of the Philadelphia & Reading Coal & Iron Co.'s first-aid corps, in a recent speech before Reading Coal Company employees, said:

"Not one of you would dream of sitting down to dinner under a loose ceiling that looked as if it were about to fall, and yet some of you deliberately work for five hours a day under a loose roof in the mine."

How very true and pertinent is this homely simile of Dr. Halberstadt.

Legal Department

Legislative Regulation of Weights

BY A. L. H. STREET*

Congress having failed to fully exercise its right to fix the standard of weights and measures, it has been decided by the courts that the states are left free to make reasonable regulations on the subject, for the protection of the public. Accordingly, a Louisiana law prohibiting sale of coal contained in boats or barges until the same has been officially gaged, was upheld by the United States Supreme Court in the case of *Pittsburgh & Scranton Coal Co. vs. State*, 15 Supreme Court Reporter 459. The validity of the statute was unsuccessfully attacked on the ground that it interferes with interstate commerce, and discriminates against coal carried by vessels in favor of coal carried by rail. And a statute in force in Missouri requiring every sale of coal to be made on the basis of the actual weight thereof, and making it unlawful for a buyer to deduct any amount from the actual weight under claim of right to do so by reason of any custom, rule or pretense, was upheld by the same court in the case of *House vs. Mayes*, 31 Supreme Court Reporter 234.

Where a law requires coal sold in certain quantities to be weighed by an official weigher and a certificate of the weight to be delivered to the buyer, there can be no recovery of the price unless there is an official weighing and such certificate is issued. (*Massachusetts Supreme Judicial Court, Libby vs. Donpely*, 5 Allen's Reports 299.) There is no valid compliance with such a requirement where the weigher is the owner of the coal or is selling it on commission. (*Smith vs. Campbell*, 68 Massachusetts Supreme Judicial Court Reports 268.) And, under a Maine statute requiring coal to be weighed by a sworn weigher, "unless the parties otherwise agree," it was held that there was no showing of an agreement waiving such weighing, although it appeared that the buyer accepted the coal without objection, and offered to give his note for the price, and had paid for similar lots of coal weighed by the seller's bookkeeper. (*James vs. Josselyn*, 65 Maine Supreme Judicial Court Reports 138.)

Mistakes in Quoting Prices

When a coal company, in quoting a price on a shipment, inadvertently quotes a lower price than was actually intended, through stenographic or other clerical mistake, and the offer is accepted, is the company bound by the contract? This situation arises, doubtlessly, in the coal trade frequently the same as it does in other lines of business. Based on the decisions of the courts, the answer to this question must be that, notwithstanding the mistake, the contract is binding on the coal company, unless it can show that the person to whom the offer was made knew or ought to have known of the mistake. If this latter condition can be established, however, then there is a very recent court decision to sustain the prop-

osition that the coal company is not bound. This decision did not arise in the coal trade, but the principles involved are equally applicable to sales of all kinds of commodities which have a market value.

A Texas seed house offered to sell a quantity of millet seed at \$1.35 the hundredweight at a time when the market price was \$2.35, which the house intended to quote; the quoted price being the result of a clerical error. The Kansas seed house to which the offer was made immediately wired an acceptance of the offer, without stating the price, and sued for breach of contract, when the Texas concern, on discovering the mistake, refused to deliver at \$1.35.

In relieving the Texas company from liability, the Texas Court of Civil Appeals said in this case, *Barteldes Seed Company vs. Bennett-Sims Mill & Elevator Company*, 161 Southwestern Reporter 399: "Ordinarily, when the mistake is not mutual, courts will not relieve the party making it against his own negligence or inattention; but we think a different rule should apply when the evidence shows that the party accepting the mistaken offer knows of the mistake when he accepted it and that he should not reap the benefit of the mistake to the evident injury of the other. We think that fair dealing and good conscience should require an opportunity to correct the error, before trying to found a binding contract on it. . . . The evidence in this case is that both parties knew the market value of the millet seed on Apr. 17, 1912. Upon receiving a letter from a dealer in that commodity, appellant must have known that \$1 per hundredweight less than the market value was a mistake. That they did is evidenced by the telegram to 'Ship quick.' It did not wire back that 'Your \$1.35 per cwt. offer is accepted.' . . . We think that it is manifest from the evidence that appellant knew a mistake had been made, and sought to take advantage of the mistake by an immediate acceptance.

Recent Judicial Decisions

Duty to Warn Inexperienced Miner.—A coal company must warn an inexperienced miner against special dangers incident to his employment. (*Iowa Supreme Court, Looney vs. Garfield Coal Co.*, 147 "Northwestern Reporter," 129.)

When a Mining Company Becomes a Public Service Corporation.—A mining company engaged in furnishing surplus electricity to private consumers is subject to regulation as a public-service corporation, so far as such service is concerned. (*West Virginia Supreme Court of Appeals, Wingrove vs. Public Service Commission*, 81 Southeastern Reporter 734.)

Validity of Coal Weighing Ordinance.—An ordinance requiring all coal sold and delivered in the city, excepting in carload lots, to be weighed on the city's scales, and requiring payment of a ten-cent fee for the service and issuance of a weight ticket is a valid regulation. "The dealers can readily add the increase in expense to the price which they formerly charged for coal and protect themselves from any loss on account of the regulation." (*Wisconsin Supreme Court, Brittingham & Hixon Lumber Co. vs. Sparta*, 147 Northwestern Reporter 635.)

*Counsellor-at-Law, St. Paul, Minn.

Discussion By Readers

Working Coal Seam with Heavy Parting

Letter No. 6—The proposition submitted by Mr. Morck, *COAL AGE*, June 13, p. 981, I regard as being practicable, so far as the successful extraction of the coal is concerned. The degree of profit attending the operation would depend upon the method adopted and the relative cost of labor and market value of the coal produced. Mr. Morck has omitted a very important factor, namely, the condition of the seam with respect to gas.

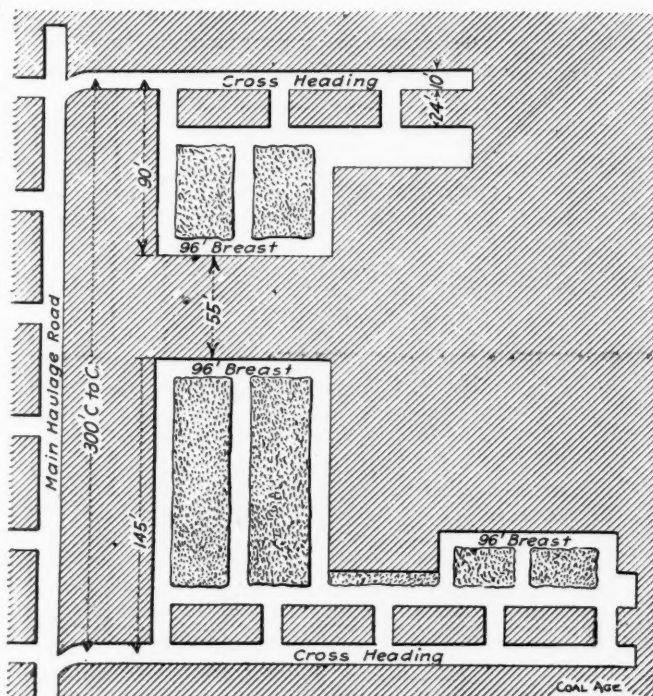
However, leaving this factor out of consideration, and regarding only the question of the adaptation of the two general systems of mining or some modification of the same, to the conditions given, permit me to say that I do not regard the longwall advancing method as adapted to this case for the following reasons: 1. The average thickness of the rock parting being 1 ft. and the two coal benches taken together being 5 ft. in thickness, gives an average thickness of 6 ft. for the entire seam, and the construction of packwalls, in an opening of this height, would involve a large expense. 2. The quantity of refuse available in the seam would not be sufficient to build packs of this size, and it would be necessary to bring material from the surface into the mine to complete the work, which would greatly increase the expense. 3. The seam being composed of material of different hardness, the resistance to the pressure of the overburden would vary in the several strata of the seam. While the effect arising from this condition might not manifest itself for some time, it is apt to prove a dangerous factor in the later development of the mine.

I have had experience in the working of a seam of coal having the same general composition as that given by Mr. Morck. The coal, however, was inferior in quality, and the roof conditions were bad. Notwithstanding these facts, the seam was mined with profit on the room-and-pillar system. The workmen, in both rooms and entries, were paid a cent per inch per lineal yard, for all rock over 4 in. in thickness. The price per yard was based on an average thickness of the rock parting, for each two weeks. The men on pillar work received no extra compensation. In this case, the coal was mined by pneumatic machines, in the bottom of the seam, and the rock was blasted with the coal. This method presented at least two important disadvantages. 1. The increased labor expense for removing the rock in the rooms. 2. The inferior quality of the coal produced by blasting the rock with the coal.

I recall seeing a modification of longwall advancing in operation in the northern bituminous field of Pennsylvania, in a 2-ft. seam of coal. I believe, with slight modification, the same method could be employed in the working of the present seam. The mine was opened on the double-entry system, the haulage roads being driven with a headroom of 5 ft. 2 in. above the rail, while the back heading was driven 4 ft. in height. Both of these entries were driven with a "skip" for gobs.

A coal face 96 ft. in length was opened off the back entry in sections of 24 ft. each, these being worked in steps. Between the consecutive 96-ft. breasts, a 4-yd. pillar was left. The breasts were driven a distance of 75 yd. and no cut-throughs were made in the pillars between them. From the haulage road of the next pair of cross-entries, a heading was driven to meet the breasts just mentioned; and from these headings other breasts were driven up parallel to the cross-entries. These last, however, were driven as a single breast, there being no pillars separating them. The roof conditions being good, no effort was made to construct packs.

It can readily be imagined that this method would afford little opportunity for good ventilation, and would probably entail a loss of considerable coal. The modification I would suggest, is shown in the accompanying diagram, which shows the main-haulage road on the left



A MODIFIED LONGWALL-BREAST WORKING

and two cross-headings driven 10 ft. wide to the right and, say 300 ft. apart, center to center. A barrier pillar 50 or 60 ft. in width is left to protect the main-haulage road. Inside of each cross-heading, and parallel thereto, is driven a 24-ft. place or room parallel to the cross-heading with which it is connected by crosscuts every 20 yd.

As the cross-headings and 24-ft. places advance, 96-ft. breasts are opened out on the ribs of the latter, and driven to intersect a similar breast that is opened in the same manner, from the 24-ft. place paralleling the next cross-heading. These breasts can be worked in steps or as a single face, depending on the conditions of roof and

floor. Modifications can be made in this general method, in respect to width of pillar and opening and method of extraction of the coal, whether on the advancing or retreating plan, so as to adapt it to the conditions existing in the mine.

The system affords a good opportunity for ventilation, avoids the expense of much yardage, and, with proper care, practically no coal need be lost. A sufficient width of pillar should be left between consecutive 96-ft. breasts, to enable these to be drawn back when the breasts reach the limit, without loss of coal.

The coal can be mined by pick or machine, as conditions render advisable. I would do the mining in the bottom-coal stratum and blast down the rock and upper coal separately, for the following reasons: 1. While more holes will have to be drilled, the amount of charge for each hole will be proportionately small, which will decrease the possibility of blownout shots occurring. 2. By blasting the rock and coal separately, cleaner coal is obtained and the expense of picking the coal outside is reduced. Also, the rock is handled more readily before the coal is taken down. 3. More lump coal will be obtained from the upper seam. 4. The daily output per man is increased. I believe this method, if adopted, would greatly reduce the cost of production, per ton of coal mined, and insure greater safety to the workmen than is possible in the common longwall system; and will prove less expensive than the room-and-pillar system of mining.

I. C. PARFITT,

Jerome, Penn.

Effect of the Mine-Run Law

I was pleased to note, in a recent editorial, COAL AGE, June 13, p. 974, that the mine-run law recently passed in Ohio, is not meeting the favorable reception that was hoped by its advocates, in its practical working. Experience in Kansas has led me to predict that the passage of this law in Ohio could only bring disastrous results to the mining industry throughout the state. The following brief references to the practical working of such a law cannot fail to convince the most skeptical that the results following in the wake of such legislation can only be disastrous to the industry at large:

Under the operation of the mine-run law as a basis of payment for miner's coal, the miner is only interested in increasing his daily output of coal, regardless of its condition. To accomplish this, he uses an excessive amount of powder and shoots his coal off the solid, without undermining or cutting the shot. This class of work does not require any skill or knowledge on the part of the miner; and, as a result, the mines are fast being overcrowded with unskilled and ignorant workmen. There is greater danger of the occurrence of blownout shots when the coal is thus shot off the solid. Not only is the coal shattered and broken, producing a large amount of a lower-grade and, in some cases, unmarketable coal, but the heavy shots loosen the roof and are thus the direct cause of many accidents from falls of roof. The heavy shooting also blows out the timbers and makes the working places unsafe.

This reckless style of mining is also responsible for the production of large quantities of fine dust, at the working face and on the roadways, thereby increasing the danger

of dust explosions. In shallow mines, particularly, the damage to the roof by hard shooting and the resulting heavy roof falls cause the loss of large areas of coal that could have been worked out profitably by a more careful drifting and mining of the coal. The result is, in such districts, it is common to see "stripping" methods employed, the shallow surface being removed with steam shovels, by which many acres of surface land are destroyed and rendered worthless forever. There is still another consideration; these surface strippings produce a better grade of coal than is taken from the shaft mines, with the result that the former secure the bulk of the trade, while work at shaft mines is often slack.

The legitimate results of the mine-run law may, therefore, be summed up briefly, as decreasing the revenue from the sale of coal, by producing larger quantities of a lower-priced quality; causing the loss and abandonment of much coal that could be otherwise profitably worked; increasing mine accidents due to falls of roof, explosions of coal dust and gas; overcrowding the mines with unskilled and ignorant workmen; and, finally, destroying large areas of surface lands that would, by cultivation, prove a greater source of revenue than the coal taken from underneath them.

SUBSCRIBER,

Scammon, Kan.

Co-operation in the Mines

An item on the editorial page of COAL AGE, Apr. 18, p. 654, states: "Much good would result if coal companies would make compulsory a weekly meeting of superintendents, mine foremen, fire bosses, master mechanics, hoisting engineers, etc." I am in thorough accord with this idea, but would omit the word "compulsory."

Some months ago I instituted a series of weekly meetings of my mine foremen, by sending each one a request that he would so arrange his affairs as to meet the superintendent at the company's office on the next Wednesday evening. The time was specified as from 7:30 to 8:30, and all were present. At this meeting, the object of the gathering was stated, a general discussion held, the views of the different foremen secured, and a subject for discussion at the next meeting selected. The men were informed that while their attendance was earnestly desired, there was no intention to compel them to come; that the object was to obtain coöperation between the men and the management, with a view to increasing the efficiency; and for the further reason that an interchange of views and experience between themselves could not but prove beneficial to all concerned.

There was a cordial assent to the idea, on the part of the foremen, and a full attendance at the next meeting resulted. The subject assigned for that meeting was "Safety First," and a request had been made that each foreman should report what he had done or was doing in the way of safeguarding the men under his charge, against accident. They were also requested to report on unsafe conditions that they had observed and, for any reason, had been unable to remedy, and further to make any suggestions that occurred to them along the same line.

This meeting was very productive of results. Many valuable suggestions were made and much interest was aroused in regard to the best means of preventing acci-

dents. Many things were brought to the management's attention that might otherwise have escaped notice; and a vigorous and healthy movement was started for the removal, so far as possible, of all dangerous conditions.

These meetings have since been held regularly every week. They are wholly informal, each man expressing his views freely, and the chairman merely acting to guide the discussion and keep it somewhere within the limits of the assigned topic. At first, I acted as chairman, myself; but later each foreman, in turn, was asked to preside at a meeting; and the idea has now developed, so that each chairman suggests, at his meeting, the subject for discussion the following week. Meetings are strictly limited to one hour in length; but there have been occasions when the foremen refused to adjourn at the end of sixty minutes, and kept up an interesting discussion and debate for an hour and a half.

Each foreman is at liberty to bring anyone with him whom he thinks would be interested in the subject under discussion; as, for instance, his assistant foreman, machine boss or boss driver; and these visitors are always asked to take part in the discussion. The master mechanic, outside foreman and the engineers usually attend, also; and many of the meetings are marked by interesting and valuable discussions. Among the subjects so far discussed, besides Safety First, may be mentioned, The

Recovery of Pillar Coal; Machine vs. Pick Mining; Cost of Haulage; Recovery of Material; Treatment and Handling of Stock in the Mine; etc.

The results obtained by these meetings, I do not hesitate to say, have been good. Much interest has been shown by the foremen and a spirit of coöperation and friendly rivalry aroused, both of which tend toward increased efficiency. The attendance of the meetings has been all that could be desired. Unfriendly criticism is not allowed; but different methods are discussed and debated with the greatest freedom. It has frequently happened that suggested changes in methods have been put in force, and given a thorough trial. If the change proved more economical or efficient than the old method, it was adopted as standard practice, in the camp.

The foremen are also encouraged to visit one another's mines, with a view of studying the different conditions, which "the other fellow" is up against, and observing how he has solved his difficulties. This, also, we hope will be productive of much good. I have written this brief account in the hope that the method adopted here may be approved and undertaken by others similarly situated, and our crude ideas enlarged and developed by others.

FRANK S. DAVIS, Mine Supt.,
Superior Coal Co.

Superior, Wyo.

Study Course in Coal Mining

BY J. T. BEARD

The Coal Age Pocket Book

Dry and Wet Air Compared—Strange as it may at first appear, wet air is lighter than dry air, volume for volume. This is because the water vapor in the air is much lighter than the same volume of air which it displaces. The specific gravity of water vapor referred to air as a standard or unity is 0.6235.

The weights, per cubic foot, of water vapor, dry, partly-saturated and fully-saturated air, respectively, are calculated by the following formulas:

$$\text{Water vapor, } w = 0.6235 \frac{c p_g}{0.37 T} \quad (1)$$

$$\text{Dry air, } w = \frac{p_a}{0.37 T} \quad (2)$$

$$\text{Air partly saturated, } w = \frac{p_a - 0.3765 c p_g}{0.37 T} \quad (3)$$

$$\text{Air fully saturated, } w = \frac{p_a - 0.3765 p_g}{0.37 T} \quad (4)$$

w = weight (lb. per cu. ft.), expressed as a decimal
 c = degree of saturation, expressed as a decimal
 p_a = atmospheric pressure (lb. per sq. in.)
 p_g = saturated-vapor pressure (lb. per sq. in.)
 T = absolute temperature (deg. Fahr.)

It is readily seen, from formulas 2, 3 and 4, that perfectly dry air is always heavier than air containing water vapor, and that the weight of air decreases as its degree of saturation increases. The weight of moisture in air is usually estimated in grains instead of pounds, per cubic foot, and it is necessary to multiply the results obtained from the above formulas by 7000 (1 lb. = 7000 grs.).

The same formulas expressing the atmospheric pressure and the vapor pressure in inches of barometer, instead of pounds per square inch, are as follows:

$$\text{Water vapor, } w = \frac{0.82757 c p_g}{T}$$

$$\text{Dry air, } w = \frac{1.3273 B}{T}$$

$$\text{Air partly saturated, } w = \frac{1.3273}{T} (B - 0.3765 c p_g)$$

$$\text{Air fully saturated, } w = \frac{1.3273}{T} (B - 0.3765 p_g)$$

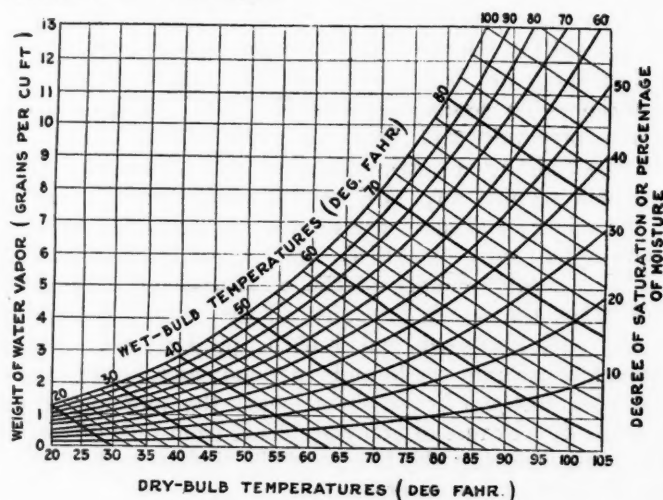
It is evident that when air is fully saturated, $c = 1$, and disappears from the formula. The values of p_g are given in a preceding table, in pounds per square inch and inches of mercury.

Important—Properly speaking, a vapor does not saturate the air, but the space it occupies; since, for any given temperature, the same weight of vapor serves to fill a given space whether that space is full or void of air. Commonly speaking, vapor is said to be saturated or unsaturated according as the space it occupies is saturated or otherwise.

The Coal Age Pocket Book

Laws of Vapors—The following laws express the chief characteristics of vapors:

1. Vaporization takes place at the surface of all volatile liquids, at all temperatures, till the space surrounding the liquid is saturated or the critical temperature is reached.
2. Vapor pressure (different for different vapors) depends on the temperature and the degree of saturation.
3. For any given temperature, the weight and pressure of a vapor saturating a given space is the same whether that space is full or void of air or other gas.
4. Saturated-vapor pressures increase with the temperature, and when equal to the pressure above the liquid vaporizing, the ebullition of the liquid begins, which marks the boiling point of the liquid for that pressure.
5. In a confined space, a further addition of heat to the liquid causes a rise of both temperature and vapor pressure till an equilibrium of densities of liquid and vapor stops further vaporization and marks the so called "critical temperature" for that liquid.



A HUMIDITY CHART

The above diagram is useful in showing at a glance the weight of water vapor that will saturate a cubic foot of space at any temperature from 20 to 105 deg. F. and the degree of humidity for different dry- and wet-bulb readings of the psychrometer.

Inquiries of General Interest

Study Question--Ventilation

In the later development of a coal mine opened some time since in a seam of clean coal 3 ft. 8 in. thick, the ventilation became insufficient, the requirement of the mine being greater than the capacity of the present fan. After a thorough examination of the mine, the mine inspector decided that, in order to comply with the mine law, a circulation of 180,000 cu.ft. of air per minute was necessary. He requested that this air current should be circulated in three natural splits, as follows:

Split A, 8 × 10 ft., 3600 ft. long

Split B, 6 × 12 ft., 5000 ft. long

Split C, 7 × 14 ft., 4500 ft. long

I would like to ask where the regulators should be placed in these airways; and what will be the size of the opening in the regulator, in each split. Also, what will be the least expenditure of power, in order to produce the required circulation in these splits. Assuming a single intake fan, what must be the required diameter of the fan that will produce the required volume of air in this mine?

The mine is a drift opening, and the main air current of 180,000 cu.ft. per min. must pass through the main airway, which is 6x14 ft. and 800 ft. long, including its return, to the point where the air is divided between the three splits mentioned.

HARRY M. DANIELS, Mine Foreman,
Cabin Creek Consolidated Coal Co.

Wake Forest, W. Va.

In answering this question, it should first be stated that no regulators are required in the *natural* division of an air current. It is only when a proportionate division is required that regulators must be introduced in every split but one, which remains open. The purpose of the regulators is to increase the pressure in each of those splits where the regulators are placed, to make it equal to the natural pressure of the free or open split. The "free split" is one having the highest natural pressure; and this pressure becomes the ventilating pressure for all the splits.

The areas, perimeters and lengths of the main airway and splits, respectively, are as follows:

Main airway $a = 84$ sq.ft.; $o = 40$ ft.; $l = 800$ ft.

Split A, $a = 80$ sq.ft.; $o = 36$ ft.; $l = 3600$ ft.

Split B, $a = 72$ sq.ft.; $o = 36$ ft.; $l = 5000$ ft.

Split C, $a = 98$ sq.ft.; $o = 42$ ft.; $l = 4500$ ft.

In the present case, the division being natural, the quantity of air passing in each split is proportional to its pressure potential. The respective potentials for the main airway and the three splits are as follows:

$$\text{Main airway, } X_1 = a \sqrt{\frac{a}{lo}} = 84 \sqrt{\frac{84}{800 \times 40}} = 4.304$$

$$\text{Split A, } X_a = 80 \sqrt{\frac{80}{3600 \times 36}} = 1.988$$

$$\text{Split B, } X_b = 72 \sqrt{\frac{72}{5000 \times 36}} = 1.440$$

$$\text{Split C, } X_c = 98 \sqrt{\frac{98}{4500 \times 42}} = 2.232$$

$$\text{Sum of split potentials, } \Sigma X_p \dots \dots \dots 5.660$$

The quantity of air passing in the main airway and each respective split is, then, as follows:

Main airway, (total circulation) 180,000 cu.ft. per min.

$$\text{Split A, } q_a = \frac{1.988}{5.66} \times 180,000 = 63,220 \text{ cu.ft. per min.}$$

$$\text{Split B, } q_b = \frac{1.44}{5.66} \times 180,000 = 45,800 \text{ cu.ft. per min.}$$

$$\text{Split C, } q_c = \frac{2.232}{5.66} \times 180,000 = 70,980 \text{ cu.ft. per min.}$$

Since the pressure for all the splits is the same, the split pressure may be calculated from any one of these splits, as, for example, Split A. This split pressure when found must be added to the pressure required to pass the total quantity of air through the main airway, to obtain the total mine pressure; thus:

$$\text{Splits, } p_a = \frac{k l o q^2}{a^3} = \frac{0.00000002 \times 3600 \times 36 \times 63,220^2}{80 \times 80 \times 80} = 20.23 \text{ lb. per sq.ft.}$$

$$\text{Main airway, } p_1 = \frac{0.00000002 \times 800 \times 40 \times 180,000^2}{84 \times 84 \times 84} = 34.98 \text{ lb. per sq.ft.}$$

$$\text{Total mine pressure } \dots \dots 55.21 \text{ lb. per sq.ft.}$$

Or these unit pressures may be found by dividing the quantity of air passing in any airway, by the corresponding pressure potential, and multiplying the square of the quotient by k ; thus,

$$\text{Splits, } p_b = k \left(\frac{q_b}{X_{pb}} \right)^2 = 0.00000002 \left(\frac{45,800}{1.44} \right)^2 = 20.23 \text{ lb. per sq.ft.}$$

$$\text{Main airway, } p_1 = k \left(\frac{Q}{X_{p1}} \right)^2 = 0.00000002 \left(\frac{180,000}{4.304} \right)^2 = 34.98 \text{ lb. per sq.ft.}$$

$$\text{Total mine pressure } \dots \dots 55.21 \text{ lb. per sq.ft.}$$

The horsepower on the air, in this case, is

$$\text{Horsepower, } H = \frac{Qp}{33,000} = \frac{180,000 \times 55.21}{33,000} = \text{say } 300 \text{ hp.}$$

Allowing 60 per cent. for the efficiency of the fan and engine, which is customary practice, the indicated horsepower of the engine driving the ventilating fan would be $300 \div 0.60 = 500$ hp. We would not recommend building a fan that would be designed for this circulation, inasmuch as the ventilating pressure required is far too high for the economical ventilation of the mine. The air current should be further split to reduce this pressure to, say from 10 to 15 lb. per sq.ft. of section.

Examination Questions

Montana Mine-Foremen's and Firebosses' Examination

(Continued from last issue)

Ques.—What is meant by the terms, "ventilating pressure," "water gage" and "resistance of air?"

Ans.—Ventilating pressure is the pressure producing the ventilation. The term properly describes the total pressure exerted on the entire sectional area of the airway. The unit of ventilating pressure is then the pressure per square foot of sectional area. The expression "ventilating pressure," however, is often used when the unit pressure is meant.

A water gage is a bent glass tube attached to a stand-ard or base, as shown in the accompanying figure. The water placed in the bend of the tube is acted on by the



A WATER
GAGE

air pressure, which is exerted through each of the open ends. One of these ends is bent at right angles so that it can be extended through a hole in a brattice on which the instrument is placed. The brattice divides the intake airway from the return. The water in the gage is thus acted upon by two different pressures, the intake and the return pressures. The intake pressure being always the greater, depresses the water in that arm of the gage, the liquid rising an equal amount in the other arm. The difference between the water levels, which in the figure is 3 in., indicates the difference of pressure between the intake and the return airway. This is the unit of ventilating pressure, and is equal to 5.2 lb. per sq.ft. of area, for each inch of water-gage reading; or $3 \times 5.2 = 15.6$ lb. per sq.ft.

The resistance of the air, in mine ventilation, is due to the friction of the air current rubbing against the sides, top and bottom of the airways and striking against other obstructions in the passage. It is this resistance to the passage of the air current that produces the ventilating pressure, to which it is equal.

Ques.—If an open light is placed in a large body of marsh gas unmixed with air, what would be the result? Give your reasons.

Ans.—Assuming that it were possible to place a lighted safety lamp within a large body of marsh gas unmixed with air, the flame of the lamp would thereby be deprived of the oxygen necessary to support its combustion and, as a result, would be promptly extinguished by the gas. Flame cannot burn in the absence of oxygen, and there is no available oxygen in marsh gas (CH_4), unless the gas is diluted with air.

Ques.—How many cubic feet of air is passing per minute along an airway 6 ft. high and 10 ft. wide, the velocity of the air current being 450 ft. per min.?

Ans.—The sectional area of this airway is $6 \times 10 = 60$ sq.ft. Assuming the given velocity is an average read-

ing for the entire area of the airway, the volume of air passing is $60 \times 450 = 27,000$ cu.ft. per min.

Ques.—According to the Montana State mining law, what quantity of air should be circulated in a mine with 200 men and 20 mules?

Ans.—The mining law of the state requires a circulation of not less than 100 cu.ft. of air per min. for each person and 600 cu.ft. per min., for each animal employed in the mine; but in a mine generating firedamp, the volume of air required is 150 cu.ft. per min. for each person employed. Therefore, assuming no firedamp is present, the volume of air required, in this case, is $200 \times 100 + 20 \times 600 = 32,000$ cu.ft. per min. If firedamp is present, the volume of air required will be 42,000 cu. ft. per min.

Ques.—If a fan should double its speed, what increase would there be in the ventilating pressure, and in what proportion would the quantity of air be increased?

Ans.—Roughly speaking, other conditions remaining unchanged, the quantity of air in circulation varies as the speed of the fan and the ventilating pressure as the square of the speed. On this basis, the quantity of air in circulation would be doubled and the pressure increased four times, by doubling the speed of the fan. In actual practice, however, the quantity of air will be increased only one and three quarters times and the water gage three times the original amount, by doubling the speed of the fan.

Ques.—Explain the constant 5.2 used in connection with water-gage calculations.

Ans.—This constant expresses the pressure in pounds per square foot corresponding to a water-gage reading of 1 in. A cubic foot of water weighs approximately 62.5 lb. The weight of water distributed over 1 sq.ft., in a layer 1 in. in depth, is, therefore, $62.5 \div 12 = 5.2$ lb. Since water in equilibrium rises to the same height, regardless of the sectional area of the vessel, a water-gage reading of 1 in. represents a layer of water 1 sq.ft. in section and 1 in. deep, and corresponds to a pressure of 5.2 lb. per sq.ft.

Ques.—If 55,000 cu.ft. of air is passing through a circular shaft 10 ft. in diameter, what is the velocity per second?

Ans.—The sectional area of a shaft 10 ft. in diameter is $0.7854 \times 10^2 = 78.54$ sq.ft. The velocity of the air current, in this case, is $55,000 \div 78.54 =$ say 700 ft. per min.; or $11\frac{2}{3}$ ft. per sec.

Ques.—What are the features that render some safety lamps more sensitive to gas than others?

Ans.—The principal feature that renders a safety lamp sensitive to gas is a free upward circulation of air through the lamp, as is the case in the unbonneted Davy lamp. In other lamps, an important feature, in this regard, is the entry of the air below the flame of the lamp; it is also important to have a free unobstructed discharge of the burned gases in the upper part of the chimney. Volatile oils and hydrogen gas afford flames sensitive to gas.

Coal and Coke News

WASHINGTON, D. C.

The Interstate Commerce Commission has handed down a decision in the case of the Hughes Creek Coal Co. vs. the Kanawha & Michigan Ry. Co. as well as in the case of the Kelly's Creek Colliery Co. vs. the same. In this case it is held that there may properly be a slight difference between the rate on coal applicable to the through routes ordered and those applicable to the single movement on the Chesapeake & Ohio, this difference not to exceed 5 cents per ton.

The decision arrived at in this case is based upon the original decision of the Commission in the same cases regarding rates on coal from mines on the Kanawha & Michigan Ry. to various Eastern and Southeastern destinations. The substance of the Commission's original decision was this: It appeared that the Kanawha & Michigan and the Chesapeake & Ohio, operating in the Kanawha district, parallel each other for a distance of about 50 miles on opposite sides of the Kanawha River, with a junction at Gauley, W. Va.

Complainants are coal companies situated on the Kanawha & Michigan who were petitioning for an outlet to markets east and southeast of them. At the time of the petition, to reach these destinations they were compelled to pay the sum of the Kanawha & Michigan's local of 40 cents to Gauley and the Chesapeake & Ohio's local from Gauley beyond, which, in the case of Richmond, Va., for example, is \$1.50, resulting in a total combination rate to Richmond of \$1.90. The rate from Chesapeake & Ohio mines to Richmond is \$1.60.

Complainants contended that this 30-cent differential against them practically closed these markets, and they accordingly requested the Commission to establish through routes and joint rates from the Kanawha & Michigan stations to the Eastern and Southeastern destinations in question, asking that as reasonable rates for such through routes the Commission prescribe the rates applied to these destinations by the Chesapeake & Ohio for the movement from its own mines over its own line. The Commission decreed the establishing of the through routes and held that the Chesapeake & Ohio rates would be reasonable rates to apply to the through routes composed of the two roads, the Kanawha & Michigan to Gauley and the Chesapeake & Ohio beyond.

In reargument counsel for the Chesapeake & Ohio repeats a contention which was urged from the outset of the proceeding to the effect that the complainants' case was one solely of discrimination. This attempted limitation of the issues clearly was not sustainable upon the record, and the Commission in effect so held in its original report.

Further discussion of the point would seem to be unnecessary were it not for the insistence and emphasis with which it has been continuously advanced. It seems abundantly clear that on grounds quite apart from their charges of discrimination predicated in the main upon the alleged association in interest between the Kanawha & Michigan and Chesapeake & Ohio, the complainants were petitioning the Commission to establish through routes and joint rates.

While they were avowedly seeking the Chesapeake & Ohio's existing rates for competitive reasons, complainants also distinctly proposed these rates as the measure of what would be reasonable joint rates to apply to the through routes they were seeking. Counsel objects to the Commission's decision on the ground that while it found that the charges of discrimination were not proven, it gave relief as though for discrimination.

In passing upon the contentions thus offered, the Commission after a review of the whole situation, says:

Renewed examination of this matter has not made it entirely clear that the through routes would in all cases necessitate an extra switching movement which would not be required in the case of the single movement over the Chesapeake & Ohio from its own mines. On the ground, however, that as a general rule there would be this additional expense, taken in connection with the consideration of the two as against the one line haul, we are of opinion upon reconsideration of the case that there may properly be a slight difference between the rates applicable to the through routes and to the single movement on the Chesapeake & Ohio. This difference should not exceed 5 cents per ton.

Congress to Investigate Southern Coal Trust

Congress has at last reached the point of investigating the charges relative to the alleged establishment of a Southern

coal trust and has just begun the work of inquiry through a special committee of the Senate of which Mr. Bryan, of Florida is chairman. The inquiry is based upon charges made by B. L. Dulaney, of Bristol, Tenn., that the Pennsylvania system and its allied lines have undertaken to control shipments from southern coal fields in the interest of the so called "coal trust."

The first witness summoned before the Committee was Mr. Dulaney himself. He will be accompanied by F. C. Wright, a railroad rate expert who is to make an analysis of the coal rates that are now complained of by coast cities south of Norfolk. The claim has been that north Atlantic ports between Norfolk and New York get coal shipments which would normally be sent to tidewater at Charleston, Jacksonville and other ports.

It is believed that the investigation will broaden into an inquiry as to the relationships between the coal fields in Tennessee, West Virginia, Virginia, Kentucky and Pennsylvania on the one hand and the various railways running through those states. Officials of the roads have been asked to appear and among those who are expected are the presidents or general managers of the Atlantic Coast Line, the Chesapeake & Ohio, the Seaboard Air Line, and the Southern Railway.

It is possible that legislation may be urged as a result of the investigation or if not that the Interstate Commerce Commission may be directed to take up the matter and correct the alleged discriminating rates, if it should be concluded that nothing further in the way of legislation is desirable or necessary.

HARRISBURG, PENN.

It is reported here that indictments were filed on July 13, in the United States Court at Rochester, N. Y., against the Pennsylvania R.R., the Northern Central Ry., the Delaware, Lackawanna & Western R.R. Co. and the Delaware, Lackawanna & Western Coal Co.

All the indictments relate to transactions in connection with the mining of anthracite coal in Pennsylvania and transportation to Buffalo and vicinity, and allege unfair advantages by the railroads over other shippers.

The four companies are liable to fines of more than \$1,000,000 if convictions are obtained.

The indictment against the Pennsylvania charges violation of the commodities clause of the interstate commerce act. Under this clause railroads are forbidden to transport commodities which they own, not required by them in their own business. It is the second criminal case under this act.

The indictment charges that half a dozen coal mining corporations ostensibly separately incorporated and which ship all their coal over the Pennsylvania system, are really owned, operated and financed directly by the Pennsylvania R.R. Co. The indictment contains 25 counts, the maximum penalty under the law for each violation being a fine of \$5000.

The indictment against the Northern Central Ry. charges that it leased coal lands near Shamokin, Penn., to the Mineral Railroad and Mining Co., at a rental in the form of a royalty of 28 cents a ton, and that while the mining company has been mining and shipping a million and a half tons a year, the railroad company never has collected a cent in royalties.

The government alleged that by reason of this situation there was a discrimination in favor of this particular shipper. The indictment contains 50 counts, the maximum penalty for each violation being a fine of \$20,000.

The Delaware, Lackawanna & Western R.R. Co. was indicted for granting concessions to the coal company of the same name on shipments of anthracite, while the coal company was indicted for accepting such concessions. While the word "concession" was used, it was explained that this was one and the same as granting rebates.

It is also alleged that the Delaware, Lackawanna & Western R.R. Co. owns five coal trestles in Buffalo which are worth \$185,000. It is charged that the road expends annually for repairs and taxes \$6000 on the property. It rents the trestles to the Lackawanna Coal Co. for \$48 per annum. Because of this low rate the charge of making an illegal concession is made.

Improvements to Philadelphia Harbor

Within the next 30 days the largest vessels in the coal trade will be able to load safely full cargoes at the Greenwich Coal Piers at Philadelphia. It is said by the Department of Wharves, Docks and Ferries that the bar at the entrance to these piers, which in the past has been a menace to shipping, would be removed by Aug. 15.

For a number of years the shipping interests of this port made repeated efforts to have the bar removed, but without avail. The trouble arose over its location. As it is situated west of the 30-ft. channel, it did not come under the jurisdiction of the army engineers, and, as it is beyond the pier-head line, the city of Philadelphia was not responsible for its removal.

The determination to remove this bar was caused indirectly by a large shipping concern outside of the state. Last April the New England Coal & Coke Co., of Baltimore, wrote to the Maritime Exchange and asked if vessels 500 ft. long, 56 ft. wide and drawing 27 ft. could load safely at Greenwich and Port Richmond coal piers at any stage of the tide. The exchange replied that they could not on account of the bar just opposite the Greenwich pier.

After this the matter was dropped for some time. It was taken up later by the Joint Executive Committee on the improvement of the Harbor of Philadelphia and the Delaware and Schuylkill rivers. It eventually was referred to the Department of Wharves, Docks and Ferries. This department took the matter up with Colonel George Zinn, in charge of the United States Engineers' Office, in Philadelphia. Colonel Zinn promised to remove this bar, and about a month ago started two dredges working. Assistant Director John Meigs of the Department of Wharves, Docks and Ferries, on July 13, notified the Maryland concern that by Aug. 15 large vessels could load safely at the Greenwich piers at any time.

Shippingmen state that they look for a big increase in the coal trade of Philadelphia when it becomes generally known that this bar has been removed.

PENNSYLVANIA Anthracite

Beaver Brook—The abandoned washery at the Beaver Brook colliery, which has been out of service for the past few years has been torn down. The best of the material will be utilized for other purposes, while the poorer class will be disposed of for fire wood to the residents of the town.

Luzerne—According to the report of the national auditors of the United Mine Workers of America recently made public, District No. 1 of the Anthracite region has a balance on hand in its treasury of \$75,643.67. Two years ago the balance was only \$12,618 and last year \$52,640.68. Never has the union been so well financed and so strongly organized.

Freeland—The arrest of several coal pickers by officers of the Lehigh Valley Coal Co. has had a telling effect on the people who pick coal on company property, and the banks and strippings hereabouts present a deserted appearance. The recent crusade waged by the police officers of the company was marked by the confiscation of a number of vehicles used to haul coal by the coal pickers.

Scranton—All the lower veins of the Pine Brook mine of the Scranton Coal Co. are filled with water as a result of the storm on July 10, and between 600 and 700 men are out of work as a consequence. Officials of the company stated that operations will not be resumed for about two weeks.

Yorktown—A cave occurred on July 14, near the road leading from Beaver Brook to Yorktown, caused by an internal disturbance in the old Yorktown mines. A force of men were put to work filling the cavity for several days. The surface surrounding the cave is all cracked and may yet disappear.

Audensried—As a precaution against possible accidents, the Lehigh & Wilkes-Barre Coal Co. officials have given orders against the backing of cars or trains, making it imperative that the engine be in advance. This will lessen the possibility of accidents and make it safer to all concerned. The safety-first idea is being applied to all branches of industry, and the Lehigh & Wilkes-Barre Coal Co. is doing its share to put it into execution.

Bituminous

Connellsville—More than \$6000 worth of garden truck will be raised at the Lelsenring No. 1 plant of the H. C. Frick Coke Co. this year, according to the judges who on July 13 inspected the lawns and gardens of the employees and awarded three prizes in each class. The judges expressed regret that the prize list was so limited, and specifically mentioned 17 persons as entitled to credit for what they have accomplished.

Lilly—Independent miners of this place on July 15 announced that they would oppose the formation of a branch of the United Mine Workers of America in that town. President Patrick Gilday, of District No. 2 of the United Mine Workers, has completed plans for the starting of a branch at Lilly, and a charter has been applied for. The arrival of the charter is expected to be the signal for the opening of a battle that may have serious consequences.

WEST VIRGINIA

Charleston—The recent explosion of a keg of powder in the mine of the Olcott Coal Co. at Dugriff resulted in serious injuries to 13 miners, three of whom may not recover.

Ansted—The mines of the Gauley Mountain Coal Co. have been compelled to shut down on account of inability to secure enough water for the use of the boilers. Every available supply of water has been exhausted during the prolonged drouth, and even the electric-light plant is stopped leaving the town in darkness.

Fayetteville—Two strikes at New River mines were called recently on account of local grievances. At Elverton about 80 miners quit because of the company's refusal to employ a certain man as check weighman. The company did not consider him competent, and declined his employment after he was duly elected by the miners. At Kaymoor No. 2 mine the men quit because of the company's employment of Howard Wilson. He is objectionable to the miners because he has been employed as a guard at Loop Creek mines and is charged as being a member of the Baldwin force of detectives. About 50 miners went out.

KENTUCKY

Whitesburg—The Elkhorn Coal Co. is getting in readiness to begin shipping coal from its new operation at the Mater-Kona station, on the main line of the Lexington & Eastern R.R. A mining town of some size is rapidly nearing completion.

The next grand jury, it is said, will be charged to inquire into the matter of cocaine selling, which, it is declared, has grown to large proportions, especially among the colored population. This traffic is charged with being responsible for a large part of the disorder which occurs in this section.

TENNESSEE

Chattanooga—The Baker mines, at Baker's station, on the Cincinnati, New Orleans & Texas Pacific R.R., have been taken over by the Conger Coal Co., organized in Chattanooga with a capital of \$50,000. John E. Patton, Charles C. Moore, James M. Adams, George M. Price and J. H. McCallum are the incorporators. The mines have been in operation for several years and are considered of great value.

OHIO

Bellaire—The Cambria Mining Co., with its principal offices in Pittsburgh, has announced that it will start the Poultney and Webb mines shortly. Twenty armed guards will be placed on duty at the mines. It is believed to be practically certain that demonstrations will be made at both plants, and probably some violence will be offered by the Industrial Workers of the World. Fearing violence, several of the Union officials in this district have removed their families.

Massillon—The Goshen Valley Coal Co. of Massillon has taken leases on a large tract of coal land in Warwick and Goshen townships, Tuscarawas County. The leases were conveyed to the company by Frank Taggart, also of Massillon.

INDIANA

Kokomo—The Howard Circuit Court has ordered the mines of the Domestic Coal Co., near Brazil, sold. The company has been in the hands of a receiver, Harry Smith, Indianapolis, for more than a year. Appraisers have been appointed. The company was organized several years ago, J. E. Frederick, manager of the Kokomo Steel & Wire Co., having the controlling interest.

Terre Haute—A settlement has been reached between the operators and 250 miners of the five strip mines of the state, and the men are at work again. The scale of wages is to be left to a board of arbitration.

Sullivan—The Citizens mine, formerly owned by the Monon Coal Co. and shut down for four years, has been reopened by the new owners and the No. 6 vein is being mined.

ILLINOIS

Herrin—Mine No. 7 of the Big Muddy Coal & Iron Co., which has been shut down for practically 18 months, is expected to resume operations in about 30 days. A new crusher is being put in and the plant overhauled. It will give employment to 500 men.

The properties of the Chicago & Carterville Coal Co. are both idle. A recent storm put mine A out of commission by blowing away the smokestacks and damaging the property otherwise, and it will be Sept. 1 before mine B, the top works of which were recently destroyed by fire, can be put in shape for operation.

MISSOURI

Creighton—Repairs are being made in the mine at Creighton, in Cass County, and actual producing probably will begin in the immediate future.

ARKANSAS

Prairie Creek—The tipples of three mines of the Mammoth Vein Coal Co., at Prairie Creek, near Hartford, were destroyed on July 17, following a six-hour battle between union and nonunion miners and guards. The damage is estimated at \$200,000. The guards were routed by the union men, who, it is alleged, fired the surface plants.

KANSAS

Pittsburg—The Chamber of Commerce has decided to take a prominent part in exploiting coal and other products at the International Dry Farming Congress and Soil Products Exposition, to be held at Wichita, Kan., in October. Comprehensive exhibits showing the importance of the coal-mining industry, are planned.

Mineral—The strike of the Joplin & Pittsburg Ry. has continued without developments. Miners living at Mineral are walking from one to three miles to their work, others in the district being equally handicapped by the interurban tie-up.

TRADE CATALOGS

The Central Foundry Co., New York. "Valve, Service and Roadway Boxes." Twenty-three pages 3½x6¼ in.

The Electric Weighing Co., New York, N. Y. "Electric Conveyor Scales." Pamphlet of six pages illustrating and describing automatic weighing devices.

The T. L. Smith Co., Milwaukee, Wis., catalog No. 300 "Smith Mixer." Sixty-three pages 6x9 in. profusely illustrated, describing the construction and application of Smith mixers.

The Wagner Electric Mfg. Co., St. Louis, Mo. Bulletin 104 "Portable Instruments." Forty-seven pages 8½x11 in. illustrating and describing electrical testing instruments and their application.

PERSONALS

J. F. Smith has accepted the position of superintendent for the Montevallo Mining Co., at Aldrich, Ala.

Daniel Young, of West Scranton, Penn., has been appointed general superintendent of the Scranton Coal Co., to fill the vacancy caused by the promotion of W. L. Allen to the general managership of the firm.

William J. Murray, general manager of the Victor American Fuel Co., and Benjamin W. Snodgrass, mine superintendent at Delagua, Colo., have been nominated for membership in the North of England Institute of Mining and Mechanical Engineers.

A. J. Meek, of the Meek Coal Mining Co., aged 75 years, on July 14 suffered a stroke of paralysis, which rendered him speechless and helpless. Mr. Meek is also president of the Egyptian Coal & Mining Co., Merchants Exchange, St. Louis, Mo.

Dr. T. D. Scales, of Boonville, Ind., has given up his practice and is now an extensive coal operator in southern Indiana. He owns several mines about Evansville and Boonville and disposes of a considerable amount of their output in the Louisville market.

O. J. Patzold has been appointed sales manager for the La Follette Coal, Iron and Ry. Co., by George M. Shoemaker, manager of operations under Neil Robinson, receiver for the above named company. Mr. Patzold will have his office at the La Follette mines in Tennessee.

Daniel B. Torpy of Marietta, Ohio, has been appointed receiver for the Marietta, Columbus and Cleveland R.R., which runs from Marietta to Palos, on the T. & O. C. The suit for a receiver was filed by the Knickerbocker Trust Co., of New York, which held a mortgage on the property.

James W. Paul, former chief of the West Virginia Department of Mines, was recently granted letters patent for a portable signal apparatus to be used in coal mines. The device, should its use be adopted, would be a material factor in avoiding accidents inside the workings.

Arthur I. Young, for the last year, first-aid miner with the rescue car at Pittsburg, Kan., has been promoted to foreman in charge of the rescue station, with full charge of the local operations of the United States Bureau of Mines. Mr. Young succeeds H. D. Mason, Jr., who recently was transferred to Pittsburgh, Penn.

"Aunt Polly" Davis has come into the limelight of late by reason of articles in the Louisville papers containing her picture and that of her cabin in the midst of a 1000-acre farm which is exceedingly rich in coal and timber. She works the farm, with the assistance of a little help occasionally, although she is 82 years of age. She has \$33,000 in the bank, but has elected to live a secluded life.

H. S. Gay, general manager of the Gay Coal and Coke Co., of Logan, W. Va., sailed this week from Boston for Scotland, where he will attend the Napier Tercentenary Celebration, an event to be held under the auspices of the Royal Societies of Edinburgh and London, and will read a mathematical paper entitled "The Approximate Determination of the Function of the Angle and the Converse." Mr. Gay is one of the two Americans who will read papers on this occasion. He has devoted much of his spare time during the past 20 years to the theories covered in the article, mathematics being one of his hobbies.

OBITUARY

Daniel H. Davis, banker, capitalist and one of the wealthiest men in Clay County, died at his home, Brazil, Ind., July 14. He was born near Cardhill, Wales, and came to America at the age of 17. He was a coal miner for several years at Scranton, Penn., and Knightsville, Ind., but went into the mercantile business and laid the foundation of a fortune now estimated at over \$1,000,000. He organized two of the largest coal companies in the Indiana block coal field, and at one time was probably the largest producer in the state. He was an officer or director of several Indiana banks and trust companies and held appointive offices of importance from postmaster to trustee of public institutions.

Archibald F. Law, vice-president and treasurer of the old Temple Iron Co., which was dissolved recently by decree of the United States Supreme Court, died at his home, 1515 Adams Ave., Scranton, Penn., on the morning of July 18. He had been failing for some time and hope for his recovery had been abandoned. He was 59 years old.

Mr. Law was born in Scranton and began his career with the Lehigh Valley Coal Co., starting as weighmaster. In 1885 he became connected with the firm of Simpson & Watkins, colliery operators, and when that firm disposed of its properties to the Temple Iron Co. he became president of the Temple's subsidiary companies and vice-president and treasurer of the holding company.

Besides his connection with the coal mining business, Mr. Law was president of the Wyoming Electric Co., director and treasurer of the Mears Mining Co., of Joplin, Mo.; a director of the Title Guaranty & Surety Co., the Peckville National Bank, the Forty Fort Silk Co., the Scranton Trust Co. and the Lytle Store Co., of Minersville.

He was active in all the principal local social organizations, was a member of the Green Ridge Presbyterian Church and a 32d degree Mason. He leaves his widow and one son, Frank E. Law, a mining engineer, in Mexico. His only daughter, Mrs. Frank M. Rutter, and her husband were killed in a New Haven wreck about a year ago. In 1905 Mr. Law presented the town of Jessup with a 5000-volume library, which will now be known as the A. F. Law Memorial Library.

CONSTRUCTION NEWS

Ironton, Ala.—The Alabama Co. one of the largest coal and iron producers in the Birmingham district announces that it will re-line immediately its furnace at Ironton at a cost of approximately \$20,000.

Dante, Va.—The Clinchfield Coal Corporation recently awarded the Roberts & Schaeffer Co., of Chicago, a contract for building a large Marcus coal tippie for installation at the Dante mine. The contract price was approximately \$50,000.

Birmingham, Ala.—The Alabama & New Orleans Transportation Co. states that by Jan. 1, it will have on regular schedule at least 10, steel, self-propelling barges for transporting coal down the Warrior River to New Orleans. Seven are now in operation, and three more are building.

St. Clair, Penn.—Contractors have turned over to the Reading Ry. Co. a \$300,000 auxiliary to the million-dollar, 75-track coal-shipping yard recently opened between this place and Mill Creek, in the shape of thoroughly equipped car shops. These have been building nearly two years.

Sandusky, Ohio—The new loading machinery just installed at the new Pennsylvania docks in this city will be tried out in the course of a few days. This is part of the \$1,000,000 dock improvements now under way in this city, which it is believed will make Sandusky one of the first coal ports on the Lakes.

Birmingham, Ala.—The American Tar Products Co. has located a site just north of the by-product plant of the Woodward Iron Co., and has engaged the entire tar output of the coke-oven plant out of which it will distill creosote and soft pitch. The present investment is \$100,000, but this will soon be increased to \$250,000.

Yolande, Ala.—The Yolande Coal & Coke Co., with mines at Yolande and Abernath, Alabama, anticipates making improvements costing between \$25,000 and \$30,000 on its plants, including the installation of motors at both places, the opening of a new slope at Yolande and the erection of a modern school house. Work has already been started on all of these improvements.

La Follette, Tenn.—The Vasper Coal Co. is contemplating an 800-ft. rock stope on a 33½-degree pitch to the Rex seam of coal on a tract leased from the Lindsay Coal & Land Co., of Knoxville, Tenn. When the coal is reached which will be within a few days it is expected that a modern plant will be installed. The Lindsay Coal & Land Co. has also just completed a slope to the same seam of coal at Careyville, for development purposes.

Birmingham, Ala.—The Pratt Consolidated Coal Co., the largest independent operating company in Alabama announces that it will build a fleet of steel barges for the purpose of conveying coal down the Warrior River to Mobile. Each barge will have a capacity of 500 tons, and three will be transported at a time by a tow boat, it being decided not to employ the self propelling barges at this time. The company already has a number of the latter type of coal boats, both at New Orleans and Mobile.

Floodwood, Ohio—Satisfactory progress on the construction of the huge power plant being erected by the Central Power Co. is being made. The large concrete foundations have been completed and the brick work will be rushed. It is the intention to push the transmission lines also so that when the plant is completed, about Nov. 1, the mines in the vicinity can be furnished with electric current. The company has 1000 acres of coal adjoining the plant. Fuel will be fed into the furnaces by gravity and the ashes will be removed in the same manner. The capacity will be 7000 hp.

NEW INCORPORATIONS

Leechburg, Penn.—The Valley Coal Co. has been organized with a capital of \$20,000. The incorporators are Joseph G. Beale, E. H. Beale, Alfred Hicks, L. W. Hicks, and A. N. Hicks.

Ebensburg, Penn.—The Springfield Coal Co. has been organized with a capital stock of \$25,000. The incorporators are, A. W. Evans, Harry Bell, and Leonard S. Jones, of Ebensburg.

Nashville, Tenn.—The Conger Coal Co. has been organized with a capital of \$50,000. The incorporators are John E. Tatum, Charles C. Moore, J. M. Adams, George M. Price, and J. H. McCallum.

Pittsburgh, Penn.—The Clifton Coal Co. has been incorporated in West Virginia, with a capital stock of \$100,000, by L. A. Bennett, Thomas Watson, J. J. Harter, George Shepard and R. M. Atkinson. The company will operate in West Virginia.

Pittsburg, Kan.—The Domestic Coal & Fuel Co., which will develop about 500 acres of strip and shaft coal lands in the Pittsburg field, has been formed. The capitalization is \$100,000. A. H. Schlanger is president, other officers being George H. Mackie, vice-president, and C. M. Sweeney, secretary-treasurer. Sales and executive offices will be in the Globe building at Pittsburg.

INDUSTRIAL NEWS

Venice, Ill.—The coal chutes of the Chicago & Alton R.R., with several loaded coal cars and empties, were recently destroyed by fire, with a loss of approximately \$20,000.

Coalfield, Tenn.—The Baker Coal Co. mine near Petros has been purchased from Ray M. Baker, of Rockwood, Tenn., by John E. Patton, president of the Sewanee Fuel & Iron Co., of Chattanooga.

Baton Rouge, La.—Thirty-one coal barges belonging to the Monongahela River Coal Co. sank here July 14, during a heavy rain storm. The coal was valued at \$75,000 and a large force is now trying to raise the barges.

Birmingham, Ala.—Within the past few weeks, the Sloss Sheffield Steel & Iron Co. has sold upwards of 50,000 tons of pig iron for delivery during the balance of the year. It has also closed contract with the Central of Georgia Railroad for 40,000 tons of coal for delivery during the next 12 months.

Charleston, W. Va.—The records in the office of Earl Henry, chief of the Department of Mines show that for the six months ending June 30, 1914, there were 370 fatalities. One hundred and eighty of these, however, occurred in the disaster at Eccles, this leaves 190 fatalities, with the mines running under normal conditions.

Lilly, Ky.—On July 27, E. G. Stooksbury, trustee for the creditors of the Ideal Block Coal Co., will sell at public auction the machinery and fixtures of the above named company, consisting of a steam shovel, steam boilers, pumps, electric hoists, Sullivan undercutting machines, coal cars, etc. This sale will take place at the mines about 2½ miles from Lilly.

Chicago, Ill.—The Illinois Pipe & Mfg. Co., of Chicago, has bought the entire surface plant of the Cardiff Coal Co., of Cardiff, Ill. This includes one steel tippie with its equipment, all boilers, hoisting engines, three sets of railroad scales, shaker engines, 400 coal cars, the rails in the mine and all equipment and supplies. These will now be offered for sale as second-hand equipment.

Columbus, Ohio—One of the effects of the settlement of the mining suspension in the Hocking Valley, Jackson, Crooksville and Pomeroy districts in Ohio is the resumption of work at the various railroad shops in order to get the coal cars in shape for traffic. Orders have been issued for resuming work at the shops of the Hocking Valley in Columbus and Logan and the Kanawha and Michigan at Hobson.

Columbus, Ohio.—The dissatisfaction which has been expressed by Ohio physicians with the manner in which their charges for medical attendance on injured workmen have been adjusted by the Ohio Industrial Commission is in a fair way to be settled, as the Ohio State Medical Association has appointed a committee, at the suggestion of the state authorities, to take the matter up and assist in arriving at an adjustment of the question.

Pittsburg, Kan.—The report of Eugene McAuliff, general fuel agent for the Frisco, for the fiscal year ending June 30, indicated that the coal tonnage on that road constituted one-sixth of the revenue tonnage. Several interesting points were discussed in the report. Mr. McAuliff asserted that a mistaken sentiment among operators that a car was loaded with coal when it is level full is evident. He stated that even when a car is crowned up, the load is still less than the capacity of the trucks.

Wheeling, W. Va.—After breaking all records for the amount of coal hauled in West Virginia and Kentucky for the fiscal year which ended June 30, the Chesapeake & Ohio Railway continues to keep up the high daily loading maintained last year. During the first ten days of July 579,920 tons were loaded in the fields mentioned, 41,200 tons of this being on the Big Sandy & Elkhorn road. This is an increase of 169,220 tons over the corresponding period of last year, and indicates that 1914 will show a heavy increase over 1913.

New York City—The American Boiler Manufacturers Association will hold its 26th annual convention in New York on Sept. 1-4 inclusive, 1914. The headquarters will be established at the Waldorf-Astoria Hotel, and all boiler, tank, and stack manufacturers and fabricators of steel plates, also manufacturers and representatives of materials and supplies used by boiler makers are invited to attend the convention. A number of interesting papers will be presented and the subject of uniform boiler specifications will be thoroughly discussed.

Coal Trade Reviews

General Review

Heavy cuts in the anthracite circular and operations much curtailed. Down East bituminous market bordering on complete demoralization. Pronounced apathy in the Atlantic seaboard trade. Lake business is failing to show the expected form. Slow improvement in the Middle Western situation.

Further discouraging recessions have characterized the anthracite trade of the past week. The middle of the customary summer's dullness is at hand, with retailers placing only a few orders, and the situation further aggravated by delayed purchasing in all quarters. Heavy cuts in the circular are the rule, while both the individuals and large companies are reducing operations to nearly half capacity. A fair demand in the line trade, together with a large movement to the Northwest via the Lakes, are the only features preventing large accumulations at tidewater.

An almost complete demoralization prevails in the down East bituminous market. The situation has reached such a stage that a conference of the leading agencies was held at Boston to formulate a plan for rehabilitating the trade, and it was decided that the only corrective lay in a drastic curtailment program. Other Eastern distributing centers have failed to develop any features of a constructive nature, but the situation appears less acute and more along the line of the routine summer lethargy. There is no spot market, and the oldest operators report the dullest situation in years.

The long expected improvement in the bituminous movement from the Pittsburgh district, up the Lakes has failed to materialize, nor does there seem to be any immediate prospects for such. As a rule, tonnage figures are running close to those of last year, and consumers have little surpluses. Both spot and contract prices are subject to cuts. With the realization that the Ohio mines could not get under operation before Aug. 1, and even then only under a heavily curtailed capacity, a somewhat better tone has developed, particularly in the domestic grades. The Lake trade has proved decidedly disappointing so far, although preparations are being made to rush a heavy tonnage into the Northwest during the balance of the season. A distinctly better tone prevails as to the future.

The improving tendency in the Middle-Western market is being offset to a certain extent by the rapidly increasing production, and the delay in getting the crop movement under way. The demand is slow opening up and the disappointment is general throughout the trade. The labor scarcity, due to the heavy call for men in the farming districts, is interfering with handling the coal at the large distributing centers. The high-grade fuels are holding steady as a rule, and advances in the circular are scheduled for Aug. 1.

ATLANTIC SEABOARD

BOSTON

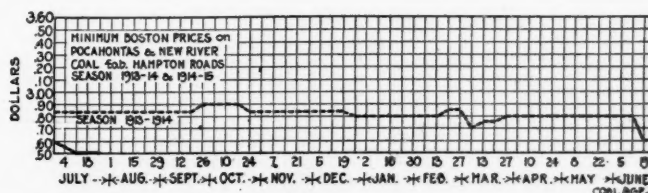
Efforts made to improve the price situation on Hampton Roads coals, but no result as yet. Pennsylvania grades in slightly better demand. Georges Creek still dull. Anthracite quiet.

Bituminous—Conferences have been held the past week to see if the ruinously low prices could be corrected at the various distributing points. So far, however, these efforts have shown no result. The local opinion is that the missionary work should be put in at the operating end and that conditions on Pocahontas and New River will get even worse unless a really drastic curtailment is enforced and further shipments of market coal are checked.

There are Hampton Roads cargoes at practically all the ports awaiting distribution orders and in varying degrees of distress. The trade here can hardly be said to feel optimistic. The only hope now is that sometime soon the West Virginia mines will close down for longer than a day or two, following the example of many of the Pennsylvania operations, and give the market a chance to tone up before the fall season starts in.

A large order for Cambria coal is understood to have been placed lately by the New Haven interests. This contract has usually been awarded to Pennsylvania shippers but Somerset County has heretofore furnished the bulk of the tonnage. A slightly better movement of the Pennsylvania grades is observed in several directions and orders are not quite so scarce as a fortnight ago. There is the same caution about sending coal to the loading piers without orders and doubtless that has been the means of keeping the standard coals from running down into low figures.

The Georges Creek situation is still dull but the prospect is opening up a little and better business is expected in August. Prices f.o.b. on this grade continue to be held very firmly.



Anthracite—Only a scattering business is offering on domestic sizes. The July 4 shut-down has been followed by another and there is no great surplus at any of the ports. Retailers here are only taking odd lots to patch out their storage.

Several anthracite barges are being tied up temporarily and it is getting to be difficult to secure orders. The consuming trade is not taking coal as early as in ordinary years.

Current prices on bituminous at wholesale are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	\$0.85@1.45	\$1.20@1.60	\$1.67@1.77	
Philadelphia*	2.10@2.70	2.45@2.85	2.92@3.02	
New York*	2.40@3.00	2.75@3.15	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				\$2.50@2.80
Boston†				3.10@3.58
Providence†				3.15@3.63

* F.o.b.

† On cars.

NEW YORK

Soft coal business down to an irreducible minimum. Operations heavily restricted. Heavy price cutting in the anthracite market. Some individuals are closed down for a full month.

Bituminous—The most searching review of the local soft-coal situation fails to disclose any important new features. The situation is no worse than it has been for the past several weeks, probably because there is little room for any further changes in that direction, but the long-expected developments of a constructive nature, which the market optimists have so consistently predicted, have still failed to develop.

The leading feature of the week has been the final closing of several more or less important contracts, including the American Locomotive, International Paper, General Electric and the majority, if not all, of the navy business. Contradictory reports are current regarding the contract of the New Haven subsidiary, but indications are that it has also been closed. Considerable railroad business is yet to be negotiated.

In the bunkering trade, business continues as slow as ever, vessels seeming to find it impossible to procure business due partially to the increased freight rates. This is also affecting export business. Some demurrage coal is appearing where operators resort to full time operations for certain compelling reasons unnecessary to mention. Although there is still scarcely any prompt business being negotiated, the market cannot be quotably changed for the past few weeks, which we continue as follows: West Virginia steam, \$2.50@2.60; fair grades Pennsylvania, \$2.55@2.65; good grades of Pennsylvania, \$2.70@2.80; best Miller Pennsylvania, \$3.10@3.15; Georges Creek, \$3.15@3.25.

Anthracite—The hard-coal trade has experienced a week of further recessions and disappointments. Evidences of

heavy cutting on the part of individuals is seen in the report that a number of the independent collieries of the Erie R.R. have definitely suspended operations from now until the middle of August. While similar suspensions are the rule on the Philadelphia & Reading, the Pennsylvania and the Lehigh Valley, these are due to the strong demand for Lehigh coal for line shipments, and the light call for Wyoming and the free burning varieties. The abnormally heavy demand for the Lehigh grade all-rail has prevented accumulations at tidewater, but on the other hand the decreased demand for the Wyoming and free-burning varieties in the line trade have thrown heavy tonnages of these into the tidewater market and resulted in substantial cuts in the circulars.

Chestnut, the circular price of which is 25c. above stove, is now being quoted at less than the latter at tidewater; because of the light local demand chestnut is being diverted to the Cape and other down East points. Dealers report that the individuals are offering the best grades of Wyoming, egg and stove coal down to the April circular, while nut is quoted at \$4.75@4.90. The steam grades are still relatively inactive, the better qualities moving at a slight reduction, but large concessions required to dispose of the off grades. A fairly good demand for pea coal in the line trade has prevented an abnormal accumulation at tidewater.

Mining operations are being conducted on about half-time basis. The market is now quotable as follows:

	Upper Ports		Lower Ports	
	Circular	Individual	Circular	Individual
Broken.....	\$4.90	\$4.60@4.90	\$4.85	\$4.55@4.85
Egg.....	5.15	4.95@5.15	5.10	4.85@5.10
Stove.....	5.15	5.05@5.15	5.10	5.00@5.10
Chestnut.....	5.40	4.95@5.40	5.35	4.75@5.35
Pea.....	3.55	3.40@3.55	3.50	3.25@3.50
Buckwheat.....	2.80	2.60@2.80	2.50@2.75	2.05@2.75
Rice.....	2.30	2.15@2.30	2.00@2.25	1.50@2.25
Barley.....	1.80	1.60@1.80	1.75	1.25@1.75

BALTIMORE

Business generally flat and discouraging. Prices largely a matter of immediate necessity. Exports still hold up the average.

While hoping and believing that a few more weeks at most will see an end of the depression, the agencies here characterize the present situation as one of the worst they have experienced for some years. Consumers are simply not taking the fuel. The day of pushing coal up on contracts is at an end, and there are numerous reports of surplus fuel at various points. There is little or no spot market.

Under the circumstances the fixing of prices is rather difficult. There has undoubtedly been some sacrificing of coal where producers have been caught with too much on hand. But it is now not so much a question of price as it is to find the buyer. West Virginia coals Westward, are commanding a little better price than for Eastern consumption. Three-quarter gas has sold variously at from 80 to 90c. Lower grade Pennsylvania line coals still hold at from 85c. to \$1, with better qualities ranging at from \$1.15 to \$1.35.

Coal exporting continues heavy, and this will undoubtedly help the tonnage handled over the local piers for export, coastwise and harbor use, to a point close to normal, if not in excess of that for last year up to the present time. The increasing demand from Europe for American coal is the telling factor. Coastwise business, South is expected to pick up from now until the middle of August.

The anthracite trade is quite flat. After the middle of August, however, there should be a period of more activity leading up to the real awakening in September.

The reopening of the Maryland Steel Co. works the past week proved an encouraging feature to the trade.

COAL CARTERS

Coal carters have been reported by the "Journal of Commerce" as follows:

Vessel	Nationality	From	To	Tonnage	Rate
Mount Hope ¹		Baltimore	Calais	989	
Frankrig ²	Danish	Norfolk	Barbados	876	
Flora A. Kimball ¹ ..		Port Liberty	San Juan P. R.	321	\$2.00
L. C. Anderson ¹		Philadelphia	Jacksonville	766	1.00
Whitgift ²	British	Norfolk	Mediterranean	2842	
Sangstad ²	Norwegian	Baltimore	Nipe Bay	1459	
Robt. P. Murphy ¹ ..		Philadelphia	Galveston	572	
Tabor ²	British	Norfolk	Barbados	2392	

¹ Schooner ² Steamer

HAMPTON ROADS

Dumpings for the week show some improvement. Demand still light on all grades. One collier loaded for U. S. Government. Bunker trade continues the leader.

Dumpings at tidewater for the week will show some improvement. Foreign shipments have increased and there also seems to have been some improvement in the coastwise movement. The number of steamers calling for bunker supplies has shown up fair but as has been the case for some

time the demand for cargo coal is still light and a greater part of that moving has been on contract. Circular prices are being quoted but indications point to some cuts having been made by shippers who have more than a normal supply of coal on hand. The general accumulation of cars on the railroad yards is just about normal and while some of the suppliers have an excess quality on hand others hardly have sufficient to take care of contract business.

Practically all coal moving has been New River and Pocahontas mine-run with some small shipments of high volatile and nut and slack, the two latter grades moving to the New England market. Foreign shipments have gone to Santo Domingo, Canal Zone, Havana, Georgetown, Curacao, Naples, Brindisi, Venice, La Plata, Vera Cruz, Barbados, Trapani, Kingston, Para and Manaos.

LAKE MARKETS

PITTSBURGH

Lake shipments have not improved and are therefore disappointing. Line demand moderate. Production between 60 and 65% of full capacity. Prices still being cut on both prompt and contract.

Coal mining operations show no improvement in the past week and on the whole there has been little if any change for four or five weeks. It was fully expected that by this time there would be a decided increase in production. The first-half of the Lake shipping season was expected to be slow, but the second-half was expected to be good, making on the whole a fair showing for the season. At present there is no prospect of any measurable improvement.

The line demand has not increased and there is no immediate prospect that it will improve. The iron and steel industry is working at about 65% capacity and seems to be well satisfied that July has not brought an actual decrease in operations. Production of coal to the Pittsburgh district is at from 60 to 65% of full capacity. Some operators place the percentage higher, but evidently rest on the basis that operations at the full capacity are not really normal. Prices continue to be cut on both prompt and contract, particularly the former. Relatively little has been done in contracts the past week or two. Circular prices remain as follows: Slack, \$0@90c.; nut and slack, \$1.05; nut, \$1.15; mine-run, \$1.30; ¾ in., \$1.50; 1¼-in., \$1.50 per ton at mine, Pittsburgh district.

BUFFALO

Market continues slow but with a hopeful undertone. Sales are about equal to last year and operators are holding down outputs. Anthracite at the low point of the year. Lake shipments heavy.

Bituminous—There is about the same slow situation that has prevailed for some months, with reports from outlying points indicating that the surplus stock in consumers' hands is still large. The consumers will not buy more than they need and some of them are not able to store any more than they have. Still the trade as a rule is very hopeful. When the car supply runs down next fall there will be improvement in the trade and probably not before. It will take more than a starting up of the idle mills to make all the coal men busy, much as it would mean to the business of the country.

Some of the shippers find their sales to be fully up to the figures of a year ago and they are looking forward to the time when a small additional increase will make business really good. The mine owner as a rule complains of poor prices more than anything else. Still the disposition is to keep putting out coal. There is only a small amount of unsold coal on track. When the market drops off there is always a large amount, but after the slow trade has continued a while the coal stays at the mines till sold. The experience makes shrewd coal men, no matter how little it is relished.

There is not much report of price cutting. Good bituminous brings full prices and other grades at what can be got for it. Quotations remain on the basis of \$2.80 for Pittsburgh lump, \$2.70 for three-quarter, \$2.55 for mine-run and \$2.15 for slack. Allegheny Valley slack is about on a par with Pittsburgh and sizes from 15 to 25c. less. Slack continues duller than sizes.

Anthracite—There is about as little selling at present as is ever the case. This is the heart of the dull season, when activity is never expected, but were it not for the Lake trade the mines would find it difficult to keep in operation and as it is some are running only about four days a week. Shipments for the week were 195,000 tons and but for the wash-outs in the Scranton district, that crippled the railroads for several days, the amount would have considerably exceeded 200,000 tons.

TOLEDO

Situation somewhat improved. Prices firm and there is more buying. Grave fears as to the strike situation in Belmont County.

The situation in Toledo is showing some betterment during the past week or so. The threshing coal demand has begun in earnest while a good many contracts are being awarded by school boards. The factories are still running light which is holding the steam-coal demand down somewhat and there is no better business in the Lake trade. It is expected that the Lake business will improve in the near future as there are signs of an upward tendency in the iron and steel industry.

Others are not so optimistic, being fearful of the conditions in eastern Ohio where matters have not improved during the past week. The I. W. W.'s are still busy at the mines, and although Governor Cox is making every effort to avoid sending the troops to the mining district it is feared by many that the situation may ultimately become as serious as in Colorado. The closing down of the mines has not really affected Toledo in the least as the shortage was easily made up by West Virginia. Prices have remained unchanged.

COLUMBUS

Domestic trade better, arrangements being made to stock when mines get under way. A heavy Lake business also anticipated.

Demand for domestic coal is growing stronger every day. Dealers stocks, which have been sufficient to the present time, are rather low and as business is good they are in need of Ohio coal. Arrangements are being made to stock up just as soon as the mines are placed in operation. There is a good tonnage of West Virginia coal coming into the state.

Steam demand is also working stronger. Many users of steam grades are using West Virginia fuel and may stock it in preference to Ohio coal. Railroad contracts will be taken up as soon as the mines resume operations. Considerable is expected of the Lake trade at that time also. Preparations are being made to rush a large tonnage of Ohio coal to the Northwest via the lakes.

Prices in the Ohio fields are:

	Hocking Valley	Pittsburgh	Pomeroy	Kanawha
Rescreened lump.....	\$1.60		\$1.65	\$1.50
1 1/2 inch.....	1.50		1.50	1.40
1-inch.....	1.30	\$1.20	1.35	1.30
Nut.....	1.25		1.25	1.20
Mine-run.....	1.10	1.05	1.15	1.10
Nut, pea and slack.....	0.70		0.75	0.65
Coarse slack.....	0.60	0.60	0.65	0.55

CINCINNATI

Domestic demand is slowly improving but is still hampered, by the light consumption of steam grades. However a distinctly better feeling prevails in all quarters. The Lake movement is also below par, the volume handled to date being far below the average figure.

In spite of the adjustment of differences in the Kanawha and parts of the Ohio fields, there appears to have been no general resumption of work; and yet, with low production still the rule, the market continues decidedly sluggish, save for the normal demand for smokeless. Splint and Eastern Kentucky domestic coals are in fairly good call, but nothing out of the ordinary, and inasmuch as the industrial situation has not improved lately, operators are finding it difficult to dispose of any quantity of screenings.

However, the trade in general is thoroughly convinced that a general awakening in demand is coming very shortly. While the car supply at present is more than ample, it is rapidly falling off in some quarters, due to the demand from the wheat-growing sections. As a general industrial call for cars is anticipated, following the expected business revival, the situation may be such within a few weeks that all grades of fuel will be at a premium. At present prices are only fair, both for spot delivery and contract.

The Lake demand is proving very disappointing, and operators are more and more of the opinion that large quantities of coal were carried over from last season. Nearly all members of the trade selling coal for the Lakes report that their business is much below last year, and as the season is now well advanced the total volume handled will be abnormally small.

CLEVELAND

Inquiry for slack has brought a slight advance. Receipts are light largely because mines are making less coal. Lake conditions show slightly decreased traffic. Deadlock still prevails in the labor trouble in the No. 8 district.

There is a fair demand for slack at prices ranging from \$1.65 to \$1.70. Receipts, which were expected to be heavy over last Sunday, were light and the market is temporarily

able to hold its own. Lake shipments are somewhat smaller than they have been owing to the large stocks. As slack is made from three-quarter screenings the light shipments of Lake coal has somewhat curtailed the output.

Cambridge operators are quoting run-of-mine coal at \$1.02 1/2 to \$1.05, at the mines, subject to 90c. freight rate into Cleveland. The first coal will probably be shipped before the end of the week, but it will be toward the middle of next month before the prepared sizes can be offered. No quotations on anything except mine-run have been reported so far.

Coarse coals are much more plentiful than the market warrants and shading is quite common. High-grade coals from Pennsylvania and West Virginia are offered freely, and cancellations on Fairmount are being made. The reopening of Cambridge mines is the real cause of these cancellations, as they are coming from factories using that coal. The difference in freight rate between Cambridge and the Fairmount field to Cleveland is 25c. a ton. The consumers also prefer the local product.

No. 8 mines are no nearer operation than they were a week ago. The warlike action of the southern European miners has caused much trouble in the miners' union and the chances of making a settlement are small at this time.

The Lake trade shows a slight falling off, principally because of dock congestion. Practically all of the space devoted to coals other than those mined in Ohio is full. Reservations have been made for Ohio coal and Hocking and Cambridge will be delivered in large quantities early in August. Shipments from upper Lake docks will be better after the middle of next month, as new grain will begin to arrive at the Lake front at that time.

Quotations for shipments are as follows:

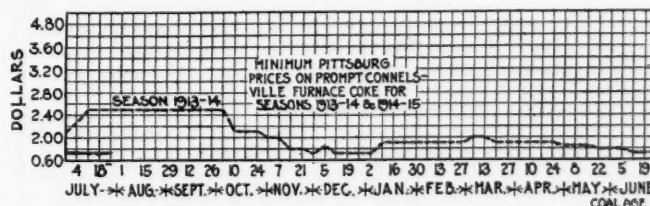
	Pocahontas	Youghiogheny	Fairmount	W.Va. No. 8
Lump.....	\$3.60			
Lump, 1 1/2 in.....		\$2.35		
Lump, 1 in.....		2.20	\$2.05	\$2.05
Egg.....	3.60			
Mine-run.....	2.60	2.10	1.95	2.00
Nut.....		2.15		
Slack.....	2.20@	2.35 1.65@	1.70 1.65	1.65@ 1.70

COKE

CONNELLSVILLE

Coke market entirely stagnant and prices possibly a shade easier. Production in the first-half of the year equal to 80% of the production rate in the three best years.

Signs of an improvement in coke, which appeared last week, have not resulted in anything tangible, and the market is as dull and stagnant as at any time. Offerings of small lots of prompt coke have been made at less than \$1.75, which has hitherto been considered the minimum of the prompt market. It is said, however, that no large tonnage could be picked up even at \$1.75. Consumers appear to be well covered and no activity is to be expected until about Aug. 1, when a few furnaces will have to cover August requirements. We quote: Prompt furnace, \$1.75@1.80; contract furnace, \$1.90@2; prompt foundry, \$2.25@2.35; contract foundry, \$2.35@2.50, per net ton at ovens.



The "Courier" estimates shipments from the Connellsville and lower Connellsville region in the first half of the year at \$1,500,000 net tons, or at fully 80% of the maximum rate maintained for any full year, the years 1906, 1912 and 1913 all having shown about 20,000,000 tons for the full year. Production in the week ended July 11 is given at 264,605 tons, an increase of 5333 tons, and shipments at 257,107 tons, a decrease of 15,795 tons.

BUFFALO

It is still impossible to find anything favorable in the coke market. The dealers are positive that the market is still weakened. They are able to obtain former prices, based on \$4.25 for best 72-hr. Connellsville foundry, but the sales are so unsatisfactory that jobbers are steadily going out of the trade. It seems to be that the slow movement enables the consumer to find more time to complain of his purchases than if business were active.

CHICAGO

A number of contracts are being signed for both furnace and foundry coke to be delivered during the last half of the year. The price fixed for most of the coke is \$5 f.o.b. Chicago. This is on the basis of \$2.50 f.o.b. the ovens at Connellsville. In some districts foundry coke has sold at \$4.85, or, if the business was specially good, at a slightly lower figure. There has been a drop of 25c. a ton in the price of furnace coke. Quotations are:

Connellsville and Wise County, \$5; byproduct, egg, stove and nut, \$4.75; gas house, \$4.25.

MIDDLE WESTERN

INDIANAPOLIS

Mining conditions not so satisfactory. Crop movement only beginning and railroads have not yet increased their purchases of coal. Mines doing about half-time, but an improvement is anticipated later, when domestic grades begin moving.

Coal operators express disappointment that conditions have not shown greater improvement, in fact, appear to have receded slightly. It was expected the movement of grain would increase the railroad buying, but this seems to be only starting and the coal business has not yet derived any benefit. It is not thought there will be any shortage of cars, on account of the large number idle.

Mine operations have been reduced until it is doubtful whether the general average is half-time. Some operators say there is just demand enough to avoid suspension, and that some coal is being sold at cost to keep the mines running. One large colliery has had only four days' work in two weeks. William Houston, president of the Indiana Mine Workers, says 4000 out of the 20,000 miners of the state have not had work since March, when the mines ceased operating at full capacity. Some improvement will naturally come in August when domestic grades begin to move to retailers' yards. In fact there is some buying of this kind now, as retailers do not guarantee present prices beyond Aug. 1. Consumers will be expecting an advance Sept. 1 and there will be increased demand to get coal into their bins before that date. Retailers have seemed to get better results this year than formerly in trying to stimulate summer demand.

CHICAGO

Labor scarcity, due to large crops, interfering with handling of coal. Domestic trade slow. Advances in some circles scheduled for Aug. 1.

Scarcity of labor in the country districts is the controlling factor in the present slump in the domestic coal trade. Attracted by the high wages offered by farmers, workers have gone to the harvest fields and rural dealers find themselves without sufficient help to unload coal into their bins. These dealers realize that unusually advantageous prices now prevail, but state they will be unable to handle their supplies until late in August.

Carterville operators find it impossible to dispose of much coal to the domestic trade and are crushing their larger sizes and selling it to steam users. Mines in this district which have been attempting to sell to the domestic trade are working only a few days a week. In the Franklin County field operators are finding it difficult to maintain the new circular price of \$1.50 on domestic sizes and some of the smaller producers have been compelled to make cuts in the circular. Springfield operators report that there is scarcely any demand for domestic coal; about half of the mines are in operation with a record of four and one-half to five days a week.

There will be an advance in the smokeless circular on mine-run Aug. 1, from \$1.25 to \$1.40. Orders are now being freely placed by retailers who wish to take advantage of the lower figure. Smokeless lump and egg continue scarce. It is reported that the shipments of Hocking coal will be resumed within a few days.

Prevailing prices in Chicago are:

	Springfield	Franklin Co.	Clinton	W. Va.
Domestic lump.....	\$2.07	\$2.40@2.55	\$2.12	
Steam lump.....	1.97		1.97	
Egg.....		2.40@2.55		\$4.05
Mine run.....	1.87	2.15@2.25	1.87	3.30
Screenings.....	1.57@1.67	1.85@1.95	1.57@1.95	

Harrisburg quotations are: Domestic lump and egg, \$2.40; steam lump, \$2.25; mine-run, \$2.15@2.25; screenings, \$1.85@1.95; No. 1 nut, \$2.55; No. 2 nut, \$2.40.

Prices for Carterville coal are: Lump and egg, \$2.40; No. 1 washed \$2.55; No. 2 washed, \$2.45.

ST. LOUIS

Improved tone to the better qualities in the high-grade field. Washed coal market weak. Mining operations in the standard district increasing and higher prices expected shortly.

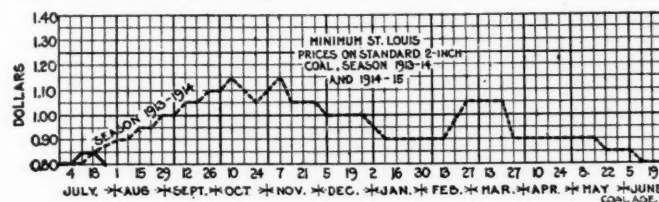
A slightly better tone in the high-grade market has been noticeable in the past week. This, of course, applies to the better grades. There are still some coals from West Frankford and from Williamson County that are down to \$1 and \$1.05 for lump and egg, but on the whole there is a tendency towards better prices, with a slightly increased demand. One of the largest companies in the field, closely allied in the past with the Missouri Pacific holdings, is concentrating domestic sizes for the season at \$1.35. This is considered suicidal by other operators. The washed market is still weak.

In the Standard field 75c. is the basis for screenings, 2-in. lump, and mine-run. The demand has not increased to any extent for this grade of coal, although some of the mines are gradually resuming operations, which keeps the market flooded. It is likely that Standard fuels will start to pick up a little in the next week or ten days on domestic sizes, and the market on screenings can be expected to drop.

Anthracite, smokeless, and coke are exceptionally dull, with the first two usually under demurrage at East St. Louis.

The circular is:

	Williamson and Franklin Co.	Big Muddy	Mt. Olive	Standard	Sparta
2-in. lump.....			\$1.20	\$0.80@0.85	\$0.95
3-in. lump.....					
6-in. lump.....	\$1.15@ 1.35		1.30	0.90@1.00	1.15
Lump and egg.....	1.85@ 2.15	\$2.00			1.15
No. 1 nut.....	1.15@ 1.35				
Screenings.....	0.75@ 0.80		0.80@0.85	0.70@0.75	0.75@0.80
Mine-run.....	1.00@ 1.15			0.75@0.80	
No. 1 washed nut.....	1.40@ 1.50	2.25	1.50		
No. 2 washed nut.....	1.35@ 1.40		1.35		
No. 3 washed nut.....	1.20@ 1.30				
No. 4 washed nut.....	1.20@ 1.30				
No. 5 washed nut.....	0.70@ 0.80				



KANSAS CITY

The big wheat yield creates favorable sentiment and the market is excellent.

Business is good in Kansas City, sales offices of various mines reporting a brisk demand from the Southwest. The wheat crop has aided both directly and indirectly in stimulating the demand for coal. Future bookings are coming in briskly. A feature of recent demand has been contracts from municipalities in both Missouri and Kansas. Many are now arranging for their fuel supplies for the next year and indications are that fall trade will be unusually brisk. Dealers are inclined to load up because of the big wheat yield. Mines in Kansas are handicapped somewhat by an interurban strike, but production is continuing in good shape.

PRODUCTION AND TRANSPORTATION STATISTICS

CHESAPEAKE & OHIO RY.

The following is a comparative statement of the coal and coke traffic from the New River, Kanawha and Kentucky districts for May and the eleven months ending May 31, 1912 and 13, in short tons:

Destination	May			Eleven Months		
	1914	%		1914	%	
Tidewater.....	298,180	17	284,109	20	3,238,342	19
East.....	187,432	10	155,872	11	2,389,123	14
West.....	1,224,767	67	908,536	62	10,361,424	61
Total.....	1,710,379		1,348,517		15,988,889	
From Connections						
Bituminous.....	110,632	6	101,854	7	1,034,622	6
Anthracite.....	1,270		2,638		14,594	
Total.....	1,822,281	100	1,453,009	100	17,038,105	100
Coke.....	31,040		29,438		359,360	
Total.....					14,440,847	100

VIRGINIAN RAILWAY.

Total shipments of coal over this road for May of the current year amounted to 359,879 tons as compared with 342,843 tons for the previous month.

PENNSYLVANIA RAILROAD

The following is a statement of shipments over the P. R.R. Co.'s lines east of Pittsburgh and Erie for June and the six months of 1913 and 1914, in short tons:

	June		Six Months	
	1914	1913	1914	1913
Anthracite.....	855,247	776,237	5,654,277	5,418,231
Bituminous.....	3,897,544	4,189,969	23,555,182	24,282,419
Coke.....	793,463	1,161,521	5,227,885	7,386,908
Total.....	5,546,254	6,127,727	34,437,344	37,087,558

IMPORTS AND EXPORTS

The following is a comparative statement of imports and exports in the United States for May, 1913-14, and for the eleven months ending May, 1912-13-14, in long tons:

	11 Months		May	
	1912	1913	1913	1914
Imports from:				
United Kingdom	6,691	8,750	200	551
Canada.....	963,033	1,255,854	938,182	74,638
Japan.....	13,165	78,812	83,851	12,315
Australia and Tasmania.....	182,266	140,825	230,081	10,840
Other countries.....	1,992	3,257	3,613	183
Total.....	1,167,147	1,487,498	1,266,411	97,993
Exports:				
Anthracite				
Canada.....	2,624,644	4,131,075	3,469,646	495,958
Uruguay.....			84	
Other countries.....	52,489	73,741	56,119	7,417
Total.....	2,677,133	4,204,816	3,525,849	503,375
Bituminous,				
Canada.....	9,613,219	10,563,330	10,678,541	1,470,590
Panama.....	447,412	443,249	336,617	49,800
Mexico.....	306,072	406,249	280,526	56,048
Cuba.....	1,032,532	1,167,681	1,048,379	132,571
West Indies.....	649,226	550,055	532,108	47,164
Argentina.....			129,432	11,078
Brazil.....			229,059	16,391
Uruguay.....			56,252	11,581
Other countries.....	1,300,897	1,060,966	1,228,486	149,667
Total.....	13,349,358	14,191,530	14,519,400	1,905,840
Bunker coal.....	6,525,093	6,666,494	7,124,527	690,228
Total.....	19,874,451	20,858,024	21,643,927	2,596,068

SOUTHWESTERN TONNAGE

The following is a comparative statement of the Southwestern tonnage for February of the years 1913 and 1914:

State	1913	1914	Increase	Decrease
Missouri.....	260,586	259,270		1,316
Kansas.....	414,413	492,304	77,891	
Arkansas.....	130,888	113,354		17,534
Oklahoma.....	297,004	257,162		39,842
Totals.....	1,102,891	1,122,090	77,891	58,692

This statement only covers the tonnage of members of the association, which is estimated to be at least 95% of the entire production.

NORFOLK & WESTERN RY.

The following is a statement of coal handled by the N. & W. Ry. during June and the past four months of the current year in short tons:

	March	April	May	June
Pocahontas Field.....	1,161,793	1,156,670	1,239,653	1,245,440
Tug River District.....	246,490	221,344	263,155	244,342
Thacker District.....	274,786	232,181	280,148	261,248
Kenova District.....	88,616	96,116	101,768	97,352
Clinch Valley District.....	153,704	156,502	150,916	156,028
Other N. & W., Territory.....	2,741	2,827	2,596	2,337
Total N. & W. Fields.....	1,928,130	1,865,640	2,038,236	2,006,747
Williamson & Pond Creek R.R.....	43,865	79,828	74,875	76,822
All other railroads.....	140,123	171,818	225,561	232,387
Grand total.....	2,112,118	2,117,286	2,338,672	2,315,956

COAL FREIGHT DECISIONS

Investigation and Suspension Docket No. 344—Coal rates from Oak Hills, Colo.

Proposed joint rates of the Denver & Salt Lake R.R. Co. and Chicago, Rock Island & Pacific Ry. Co., for the transportation of bituminous coal from Oak Hills, Colo., to destinations on the line of the Rock Island found not to be justified, and Walsenburg district basis of rates via the Rock Island to the same destinations ordered in lieu thereof.

I. C. C. No. 5702—American Coal & Supply Co. vs. Chicago & Northwestern Ry. Co. et al.

Defendants' through charges for the transportation of soft coal from Indiana mines to Terra Cotta, Ill., via Chicago, found on the facts of record not unreasonable. Complaint dismissed.

I. C. C. No. 5336 and Sub. Nos. 1, 2, 3, No. 5358 and Sub. No. 1.—McCa Coal Co., Elliott Splint Coal Co., Gilmer Consolidated Coal Co., Queen Shoals Coal Co., Morris Fork Coal Co. and Elk Manor Coal Co. vs. Coal & Coke Ry. Co.

1. In the distribution of coal cars during car-shortage periods the defendant arrived at the mine rate by adding to the estimated physical capacity the commercial capacity taken for the twelve-month prior period, dividing the result by two; Held, That in the instant case this method permits of discrimination and defendant will be required to distribute cars hereafter on basis figured on the average shipment per days worked by the mines located on its line taken for a two-year period prior to January 1, 1913.

2. The proper distribution of cars is a question of fact to be determined according to the circumstances and conditions existing in each particular case.

FOREIGN MARKETS

GREAT BRITAIN

July 10—The market is still quiet for prompt and firmer for ahead. Prices about unchanged.

Approximate quotations:

Best Welsh steam.....	\$4.80@5.04	Best Monmouthshires...	\$4.08
Best seconds.....	4.38@4.40	Seconds.....	3.84@3.96
Seconds.....	4.14@4.26	Best Cardiff smalls.....	2.58
Best dry coals.....	4.20@4.32	Seconds.....	2.46

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those of Monmouthshire descriptions are net f.o.b. Newport; both exclusive of wharfage, and for cash in 30 days.

Coke is quoted at: Special foundry, \$6.72@6.96; good foundry, \$5.04@5.76; furnace, \$4.32@4.80.

Production and Imports in Chile for 1913—The estimated production of coal in Chile for 1913 is put at 1,400,000 tons, of which the greater portion was consumed in the country. The production in 1910 was 999,918 tons, which shows an increase, but not equal to the larger consumption.

The importation of coal for 1913 was 1,218,840 tons, against 1,428,181 tons for 1912. This decrease is accounted for by the increased use of fuel oil in the nitrate fields of the north, and an increased consumption of native coal. Of the imports the United Kingdom supplied 577,795 tons, Australia, 637,310 tons, and the United States the remainder. It is generally understood in Chile that the United States will get a greater proportion of the coal trade on the opening of the Panama Canal, when the shipment of large quantities of iron ore to the United States will provide a large tonnage for this trade. When normal conditions return there will be a largely increased demand for fuel in Chile, and it would be well for American interests to be prepared for the greater market.

Coal Imports into Smyrna, Turkey—The entire amount of coal imported into Smyrna, from all sources, is about 203,500 tons annually, as follows: From England (Newport, Cardiff, Newcastle), 50,000 tons at \$6 to \$7.30 per ton; from Germany (Westphalian mines) 2000 to 5000 tons at \$5.82 to \$7 per ton; from Black Sea regions, 150,000 tons at \$4.40 to \$7.30 per ton. The Black Sea grades, being from Turkish mines, are free of duty. Coal from all other sources pays the regular Turkish duty of 11 per cent, ad valorem, which, with local dues and other expenses, amounts to about 13 per cent. An effort has been made to introduce American coal on this market. A local steamship company, flying the American flag, has been induced to give space in its warehouse for carrying the necessary stock, and trial orders for a railroad and for the gas company have been sent in.

Hongkong, China—The importation of coal in Hongkong during 1913 was the heaviest in the history of the port, the large volume being due to the large shipping tonnage entering and clearing and the increasing use of fuel industrially. The total imports for the year amounted to 1,487,750 tons, compared with 1,240,144 tons in 1912 and 1,261,672 tons in 1911. There were increased importations of Chinese coal for use locally and for reshipment to Canton. Indo-China shipments also showed notable increases, but otherwise the trade remained about the same as in recent years. Japan furnished 1,023,564 tons, Fushun, 125,608 tons, Kailan, 119,794 tons, Indo-China, 171,474 tons, Cardiff, 38,560 tons, Borno, 5250 tons, and Tsingtau, 3500 tons. The market showed a rising tendency during nearly the entire season, contracts for the new year being made at advances of from 50c. to \$1 per ton.

Financial Department

Consolidation Coal Co.

President J. H. Wheelwright, of this company, reports, in part for year ended Jan. 1, as follows:

Tonnage—The mines of the company in 1913 produced 11,157,989 net tons, compared with 10,347,100 net tons in 1912, as follows:

COAL MINED BY THE COMPANY AND ITS SUBSIDIARIES, BY DIVISIONS

	Maryl'd.	W. Va.	Penna.	Mill Cr.	Elkhorn Tot.	GrosstNet Tons.
1913...	2,127,131	4,656,640	1,743,536	459,202	973,302	9,959,811
1912...	2,162,996	4,576,484	1,748,091	522,900	228,011	9,238,482
1911...	2,178,391	3,925,329	1,671,639	456,544	8,231,903
						9,219,731

The coal mined by lessees in the Maryland, West Virginia and Pennsylvania divisions aggregated 537,871 net tons, against 600,769 in 1912.

Floods—The disastrous floods in the Middle West in March last destroyed many miles of railroad track, practically suspending through railroad traffic for several weeks, and months elapsed before transportation companies were again in normal condition. Although our mines and the transportation facilities locally escaped any direct damage by the floods, our production and shipments for the year were curtailed at least 1,000,000 tons.

Elkhorn Field—The development work in the Elkhorn field in eastern Kentucky, which has been in progress during the past 2½ years, is rapidly approaching completion, and at this date 14 mines have been opened, with an aggregate producing capacity of from 12,000 to 13,000 tons daily, or approximately 2,500,000 tons per annum. Tipples and mine buildings have been completed, mines equipped with the most modern mining machinery, all with a capacity for handling a tonnage largely in excess of the present developed capacity of the mines. The central-power plant located at Jenkins furnishes electric current for operating and lighting purposes at all of the mines, both at Jenkins and McRoberts.

Modern brick buildings, such as hospital, school houses, bakery, drug store, post office, general office, etc., have been completed, as well as dwellings for employees. Therefore, all extensive development work in this field is behind us. To increase the production from now on is a question of additional employees and from time to time the construction of additional dwelling houses for their accommodation. The coal is uniformly of the highest quality of byproduct coal produced in the United States.

Miller's Creek—The development of an additional mine was begun during the past summer some two miles from the present mines, to which point the Millers Creek R.R. has been extended. This mine will be equipped with most modern equipment, its production now being about 300 tons daily. When fully developed the mine will produce about 1800 tons daily; 100 miners' houses have been completed and a sub-station is in operation. The central-power plant at West Van Lear generates electricity for operating all of the mines in this district.

Jenner Field, in Pennsylvania.—A new mine has been located and the necessary shafts will be completed this summer. The mine is planned for a large production with most modern equipment.

Central Power Plant at Hutchinson, W. Va.—This plant was completed early in the year. Transmission lines and substations have been built; 25 miles are now electrically operated through 15 substations. Additional transmission lines and substations will be constructed this year, so that practically all of the other mines in the West Virginia division will be connected up during the year.

Capacity—The capacity of our various mines is now fully 50% above the present rate of production.

Convertible Bonds and Stock—While on Dec. 31, 1912, \$14,956,000 of our first and refunding mortgage bonds were reserved for additions, betterments and improvements, and an additional \$1,497,000 were in the treasury, the conditions of the bond market precluded the sale of bonds except at a prohibitory figure, and, therefore, as a means of procuring funds with which to carry on the development work in the new Elk Horn field, and to provide for other additions and betterments, your board early in Mar., 1913, issued \$6,500,000 of its 10-year 6% convertible secured gold bonds, convertible at 105 of par into stock any time prior to Feb. 1, 1922.

RESULTS FOR YEAR ENDING DEC. 31 (INCLUDING SUBSIDIARIES)

	1913	1912	1911	1910
Coal mined.....	9,959,811	9,238,482	8,231,903	9,370,633
Coke manufactured.....	76,050	62,647	43,740	96,692
Coal mined by lessees....	480,242	536,401	473,008	524,858
	\$	\$	\$	\$
Gross earns. (mining)....	15,443,246	13,708,564	11,420,694	12,712,256
Int. & divs. on sec. own'd.		811,853	311,431	197,848
Total gross earnings....	\$15,443,246	\$14,520,417	\$11,732,125	\$12,910,104
Operating expenses.....		\$9,896,157	\$8,467,662	\$9,186,013
Taxes.....		220,215	222,194	212,179
Interest and exchange....	11,281,655	62,092	22,437	5,969
Insurance.....		39,424	41,803	29,306
Royalties.....		212,847	172,343	234,180
Deprec. mining plant....		247,508	221,618	251,410
Deprec. misc. equipment.	334,888	95,284	78,999	59,607
Total.....	\$11,616,543	\$10,773,527	\$9,227,056	\$9,978,664
Net earnings.....	\$3,826,703	\$3,746,890	\$2,505,069	\$2,931,440
Int. on Cons. Coal bds....		639,225	517,084	265,094
Int. on sub. cos. bonds....	1,085,894	334,858	355,926	650,376
Sink fd. Cons. Coal bds....		162,958	153,618	108,950
Sink fd. sub. cos. bds....		106,960	94,605	194,444
Cash dividends (6%)....	1,509,000	1,358,865	1,201,513	1,141,552
Total deductions.....	\$2,866,974	\$2,602,398	\$2,322,746	\$2,360,416
Balance, surplus.....	959,729	1,144,492	182,323	571,024

a Cumberland & Pennsylvania R.R. depreciation amounting to \$108,230 in 1911 and insurance, \$3,544, is charged to operating expenses in according with Inter-State Commerce Commission classification.

COMBINED GENERAL BALANCE SHEET DEC. 31

Assets—	1913	1912	Liabilities—	1913	1912
Property acct. a51,333,115	47,918,327		Capital stock....	31,190,500	25,000,000
Adv. payments on coal land purch.....	1,569,900	1,355,855	Bonded debt....	22,729,000	24,410,000
Due from 1st & ref. mtge. trustee.....	b240,339	1,650,901	Convert. 6s.....	6,500,000
Stock reserved for convers'n of 6% secured bonds.....	6,190,500	Car trust bonds—assumed by C. & P. R.R.....	380,000	456,000
Stks. of allied cos.....	c3,906,888	3,636,888	Pur. mon. oblig's Briar Hill C.&C. bds. retired June 1, '11 & June 1, '12....	5,995	31,429
Other investments.....	116,400	91,400	Bills payable....	950,000	1,050,000
Sinking funds....	806,926	776,934	Acc'ts. payable....	430,431	833,767
Coal and coke....	400,969	260,785	Pay-rolls.....	205,477	308,805
Materials, supp., etc.....	1,416,680	1,130,882	Royalties payable.....	223,574	205,953
Bills receivable....	200,480	271,650	Bd. int. & divs. due.....	49,536	61,921
Acc'ts receivable	4,847,662	4,643,426	Bond int. accrued.....	399,393	246,686
Cash in banks, etc.....	1,770,806	971,401	Sinking fds. accrued.....	142,658	136,340
Cash for bond int. and divs. due.....	49,536	61,921	Div. pay. Jan. 31	375,000	375,000
Special deposits to cover royalties.....	222,503	205,128	Individuals and cos.t.....	806,888	1,640,181
			Profit and loss..	d8,774,252	8,159,416
			Total.....	73,162,704	62,975,498
Total.....	73,162,704	62,975,498			

a Property account (\$51,333,115) includes: Coal lands and other real estate. \$34,625,763; less reserve for exhaustion. \$2,824,075; balance, \$31,801,688; mining plants and equipment, \$18,056,313; less reserve for depreciation, \$2,981,031; balance, \$15,075,282; Cumberland & Penn. R.R., \$3,297,910; less sinking fund for redemption of bonds, \$774,879; balance, \$2,523,031; Cumberland & Penn. R.R. equipment, \$1,856,687; less reserve for depreciation, \$593,021; balance, \$1,263,666; floating equipment, \$1,142,419; less reserve for depreciation, \$472,971; balance, \$669,448.

b For 75% of cost of improvements, extensions, etc., \$93,419, and for expenditures on Northern Coal lands, \$146,920; total, \$240,339.

c Stocks of other cos. owned include 18,900 shares Northwestern Fuel Co. common stock, 5,400 shares Northwestern Fuel Co. pref. stock and 7,513 shares Metropolitan Coal Co. common stock. Of the above, 5,000 shares of M. C. Co. stock and 18,000 of the N. W. F. Co. com. stock, together with \$6,388,000 1st and ref. M. bonds and \$112,000 in cash are held by Equitable Trust Co. of N. Y., trustee, as collateral for convertible 6s.

d After deducting \$344,892 for discount on bonds and adjustment of accounts of previous years.

Note—For previous annual report of the company see Vol. 3 p. 904.

Note—For previous annual report of the company see Vol. 3, p. 904.

DIVIDEND ANNOUNCEMENTS

Lehigh Coal & Navigation Co.—Regular quarterly dividend, No. 143, of \$1, payable Aug. 31 to holders of record, July 31.

Nova Scotia Steel & Coal Co., Ltd.—Regular quarterly on the common of 1½%, and on the preferred of 2%, both payable July 15 to holders of record, June 30.

Central Coal & Coke Co.—Regular quarterly dividend of 1½% on the common, and 1¼% on the preferred, both payable July 15 to holders of record July 1 to 15.

Consolidation Coal Co.—Regularly quarterly dividend of 1½%, payable July 31 to holders of record July 23.